Engaging South Shore Lake Ontario Municipalities in Documenting High Water Impacts

Completed by the U.S. Army Corps of Engineers for the
Great Lakes St. Lawrence Adaptive Management (GLAM)
Committee on behalf of the International Joint Commission

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US Army Corps
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Buffalo District

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Executive Summary:

High water levels on Lake Ontario and the St. Lawrence River have directly impacted municipal infrastructure along the shoreline in both 2017 and 2019. The United States Army Corps of Engineers (USACE) was asked by the Great Lakes Adaptive Management Committee (GLAM) to conduct engagement meetings with municipalities along the U.S. shoreline of Lake Ontario and the St. Lawrence River and summarize the impacts, resiliency measures, and critical thresholds of municipal infrastructure along the shoreline during recent high water periods as reported by municipal representatives.

The intent of the meetings with the municipalities was to elicit information from the meeting participants as well as reestablish communication channels between the shoreline communities, the GLAM Committee and the ILOSLRB. The meetings were positive and informative for both members of the GLAM Committee, as well as the municipal staff that attended.

During the study, some unexpected adjustments had to occur due to COVID-19, such as holding virtual meetings with the municipalities. The attendance rate of the virtual municipal meetings was not as high as the in-person municipal meetings that were held prior to COVID-19, and the response rate to the survey was likely impacted as well.

The assessment of municipal impacts was conducted by sending out surveys to each municipality ahead of the municipal meetings. Supplemental information was also collected from New York State's Resiliency and Economic Development Initiative (REDI), as well as municipal parcel data, which was joined with an elevation dataset to estimate impacts to municipal infrastructure. Based on survey responses, most municipalities experienced some form of damage to infrastructure during the 2017 and/or 2019 high water events. Additionally, a majority of the municipalities that responded to the surveys took some form of action to help prevent damages.

Survey responses do indicate that the damage to municipal infrastructure is only a fraction of the damage that occurred to shoreline industry and businesses. Municipalities also indicated that a significant concern was the ability to properly prepare and protect private property owners and businesses from future flooding events. It is recommended that coordination with New York State occurs in the future to receive additional information about the state's actions, as well as additional data that was collected by the municipalities. Municipalities are hopeful that communication with the GLAM Committee will continue, which will help the municipalities better understand actions that the IJC is taking and better prepare for the possibility of future high-water events.

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1 Introduction

1.1 Background

In December 2016, the International Joint Commission (IJC) implemented *The Lake Ontario-St. Lawrence River Plan 2014*, a new regulation plan for the outflows of Lake Ontario, replacing *Regulation of Lake Ontario Plan 1958-D*, the previous regulation plan that had been in place since 1963. In the following years, high water levels impacted shoreline properties and businesses. There have been public concerns that the high water events were a result of the implementation of Plan 2014.

The Great Lakes-St. Lawrence River Adaptive Management (GLAM) Committee was established by the IJC to monitor Plan 2014 as well as undertake modeling and assessment required to support ongoing evaluation and regulation of water levels and flows on the Great Lakes and St. Lawrence River. The GLAM Committee reports to and provides information to the International Lake Ontario-St. Lawrence River Board of the IJC to support their decision making processes in regards to outflow management of Lake Ontario and Plan 2014.

1.2 Problem Statement

High water levels on Lake Ontario and the St. Lawrence River have directly impacted municipal infrastructure along the shoreline in both 2017 and 2019. While studies were conducted after the 2017 high water events to document impacts to municipal infrastructure as it relates to water intakes and treatment, there is a need to gather further information on impacts during the 2019 high water event, resiliency measures taken by the municipalities, and critical thresholds on the municipal infrastructure. Additionally, the GLAM Committee would like to conduct engagement meetings with shoreline municipalities to create an open line of communication for the future.

1.3 Purpose and Need

There are two primary purposes of this task. The first purpose is to conduct engagement meetings with the municipalities. These meetings are facilitated by USACE personnel, with members of the GLAM Committee presenting on the IJC's role and responsibilities. The second purpose is to summarize the impacts, resiliency measures, and critical thresholds of municipal infrastructure along the Lake Ontario and upper St. Lawrence River shoreline during recent high water periods as reported by municipal representatives.

This study assists with the GLAM Committee's directive to provide ongoing review and evaluation of Plan 2014 to support the long term assessment of regulation plan performance and impacts. This allows the GLAM Committee to support the International Lake Ontario – St. Lawrence River Board and the IJC with critical information to help inform decisions around deviations from the plan and/or for modifications to the regulation plan in order to address what has been learned and/or to address changing conditions of the system. Due to the high water event of 2017, the GLAM Committee was tasked with a more rapid execution of the requirements to manage Plan 2014 adaptively, with a focus on extreme high water supply conditions.

1.4 Study Goals and Objectives

The overall goals of this project are to develop and implement an engagement process with local shoreline municipalities within New York State to gather local information on high water impacts.

The United States Army Corps of Engineers (USACE) shall achieve the following objectives of the project:

1. Obtain information about the impacts of high water along the U.S. shore of Lake Ontario and the St. Lawrence River.
2. Provide insights into the perspective of riparians and coastal municipalities on flood risk reduction.
3. Develop an engagement process with local shoreline municipalities.

1.5 Geographic Scope

The specific geographic scope for the study includes the U.S. shoreline from the Niagara River where it enters Lake Ontario on the west to the Moses Saunders Dam along the Saint Lawrence River to the east.

1.6 Review of 2017 Impacts and Findings

Prior to engagements with municipalities, a review of previous studies was conducted to better understand the impacts associated with municipal infrastructure and to assess information that has already been collected. The review provided information on data gaps, sample survey questions and indicators that were used to create the survey used in the current study. The findings from the review indicate that a majority of municipal and industrial water users reported no impact to their facility’s operations. Additionally, water treatment plants had minimal-to-no impacts during the 2017 high water events with some even benefiting more from high water. In contrast, wastewater treatment plants are more prone to impacts during high water events. Additional information on the review of 2017 impacts are provided in Appendix A.

2 Overview of Meetings and Outreach with New York Municipalities

2.1 Identification of Municipal Contacts and Meeting Arrangement

Task 2 of the Scope of Work required that USACE identify U.S. municipal contacts and arrange meetings**,** as described below:

> *The USACE shall identify municipal shoreline practitioners (emergency managers, town engineers and planners). The USACE shall set up face-to-face or webinar style meetings between municipal representatives of shoreline communities, the USACE, GLAM /Board members, IJC staff and possibly several other individuals to be selected by the IJC Project Officer. The USACE shall arrange 4-8 meetings (approximately one per U.S. county along the Lake Ontario and upper St. Lawrence River shoreline). The USACE*

> *shall determine the sites, dates, and attendees of these meetings within three months of the effective date of the support agreement.*

Compilation of the list of appropriate municipalities proved to be a time-intensive exercise. The desired audiences for the meetings and surveys were the professionals with direct knowledge and technical familiarity with the impacts and subsequent response to the high waters in 2017 and 2019, by virtue of their official positions and technical duties on behalf of the towns, villages, cities and counties along the Lake Ontario and the St. Lawrence River shoreline. Roles and responsibilities varied from community to community in response to high waters, as did the nature and extent of damages. Some county offices assumed a more active role in the response due to circumstances such as county ownership of impacted infrastructure and a county's capacity to provide staff and resources.

In order to assemble a preliminary list of municipal and county contacts, USACE staff adopted the uniform approach of contacting the county-level Emergency Management Offices. Emergency Management Offices provided contact lists for the municipalities in their respective counties, as well as lists of other relevant county staff. USACE staff then conducted outreach with the identified points of contact. Table 1 provides a full list of contacted municipalities and Figure 4 shows the locations of each county. Simple email correspondence was effective in some cases. More often, multiple phone calls and persistent follow-up communications were required to identify a more-appropriate point of contact or technical representative. Many towns, especially in Jefferson and St. Lawrence Counties, maintain minimal and often part-time staff. Town Supervisors themselves often work separate fulltime day jobs. Several Town Clerks were very helpful in identifying the most appropriate points of contact, and later coordinating meeting attendance and survey participation. However, lack of staff may have been a negative factor influencing survey participation and meeting attendance.

Table 1: Contacted Municipalities

Municipality	County
Town of Newfane	Niagara
Town of Somerset	Niagara
Town of Porter	Niagara
Town of Wilson	Niagara
Village if Wilson	Niagara
Village of Youngstown	Niagara
Town of Carlton	Orleans
Town of Kendall	Orleans
Town of Yates	Orleans
Village of Lyndonville*	Orleans
Town of Greece	Monroe
Town of Hamlin	Monroe
City of Rochester	Monroe
Town of Irondequoit	Monroe
Town of Parma	Monroe
Town of Mexico	Oswego
Town of New Haven	Oswego
Town of Sandy Creek	Oswego
Town of Scriba	Oswego
Town of Clayton	Jefferson
Village of Clayton	Jefferson
Town of Cape Vincent	Jefferson
Village of Cape Vincent	Jefferson
Village of Sackets Harbor	Jefferson
Town of Alexandria	Jefferson
Village of Alexandria Bay	Jefferson
Town of Henderson	Jefferson
Village of Chaumont	Jefferson
Town of Lyme	Jefferson
Town of Hounsfield	Jefferson

Town of Webster	Monroe
Village of Sodus Point	Wayne
Town of Sodus	Wayne
Town of Williamson	Wayne
Town of Ontario	Wayne
Town of Huron	Wayne
Town of Wolcott	Wayne
Town of Sterling	Cayuga
Village of Fair Haven	Cayuga
City of Oswego	Oswego
Town of Owego	Oswego
Town of Richland	Oswego
Oswego Port Authority	Oswego
Town of Henderson	Jefferson
Village of Dexter	Jefferson
Town of Orleans	Jefferson
Town of Ellisburg	Jefferson
Town of Brownville	Jefferson
City of Ogdensburg	St. Lawrence
Town of Massena	St. Lawrence
Town of Waddington	St. Lawrence
Village of Waddington	St. Lawrence
Town of Oswegatchie	St. Lawrence
Town of Morristown	St. Lawrence
Town of Lisbon	St. Lawrence
Town of Hammond	St. Lawrence

* Village of Lyndonville was contacted after the meeting with Orleans County/municipal staff based on suggestions received at the meeting.

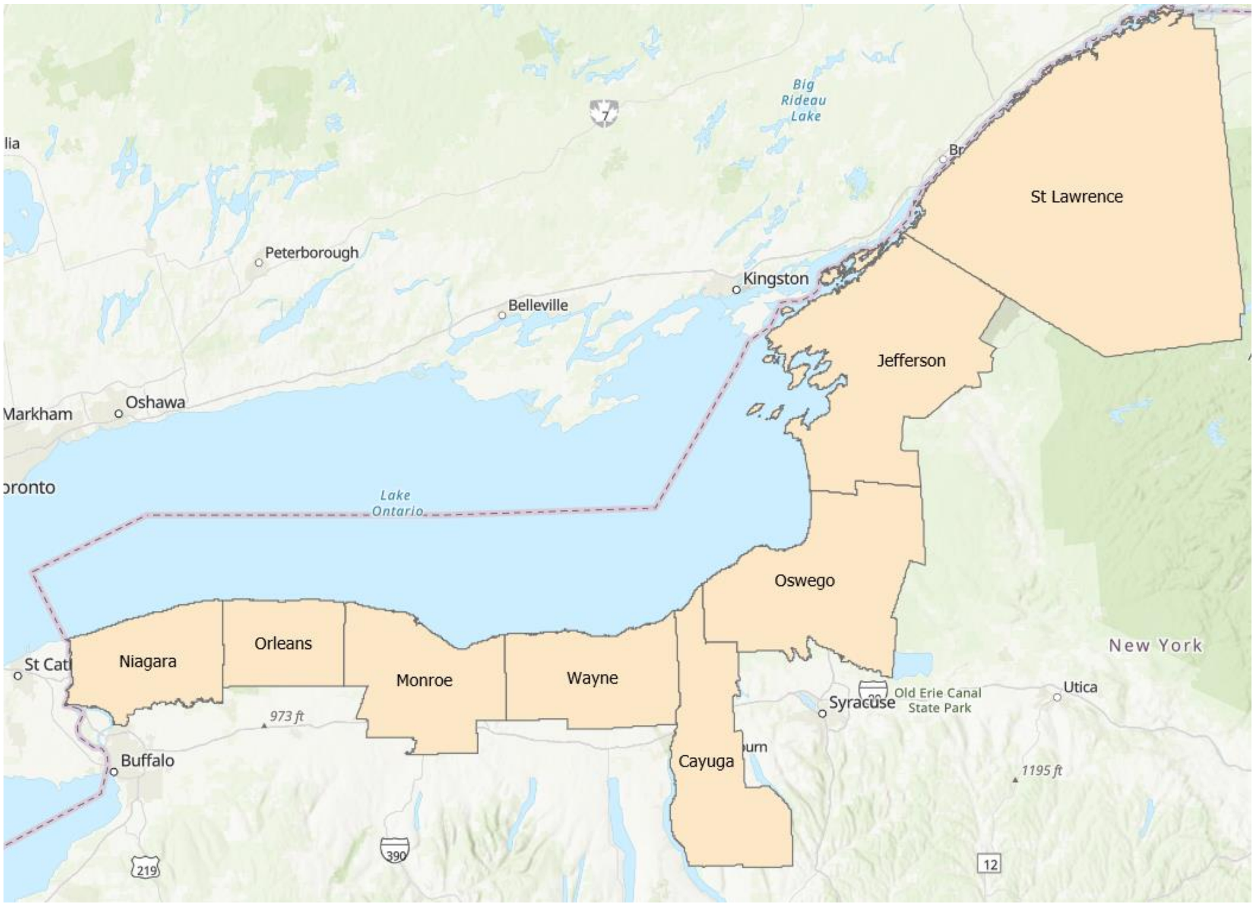

Figure 1: U.S. Counties Bordering Lake Ontario & Upper St. Lawrence River

2.2 Pre-Meeting Situation Analysis

Utilizing the assembled list of contacts, USACE staff conducted informal discussions to prepare for the meetings, to generate interest in the meetings and to build rapport for the purpose of future communication. Moreover, this engagement served as a situation analysis to improve the overall communication process for both the shoreline communities and the GLAM Committee. Municipal and county representatives offered a spectrum of feedback related to the high water levels. The identified municipal representatives comprised a diverse list of Town Supervisors and Mayors, their Deputies or Assistants, Town Board members, Highway Superintendents, Public Works Managers and staff, Planning Department Managers and staff, Flood Plain Managers, Emergency Managers and staff, a Director of a Port Authority, and still others. Direct feedback obtained during these calls will not be attributed to individuals as a professional and ethical courtesy. The discussions did not represent structured interviews or scientifically-formulated survey questions, but rather a goodwill attempt to share and elicit knowledge and information. USACE staff advised all engaged municipalities of the opportunity to share their knowledge and perceptions at the formal meetings and in their survey responses.

Many official municipal leaders and staff did in fact blame Plan 2014 and political decisions for the high waters that occurred in 2017 and 2019 and did not accept or seem aware of alternate explanations. These individuals tended to be more direct in their assessments during informal calls than during the formal meetings. Some expressed displeasure with the state and National response to what they described as devastating impacts. While some municipalities wanted to broaden the list of participants at the planned meeting to include more elected officials, others were concerned that certain politicians or interest groups would politicize or disrupt the meeting.

Other municipal staff members described effective ongoing partnership and coordination between local, county, state and National entities, both in response to past damages and in preparation for potential spring 2020 flooding. Numerous individuals alluded to ongoing meetings, funding requests, and resiliency planning efforts under the umbrella of New York's Resiliency and Economic Development Initiative (REDI). Most of the referenced datasets pertained to damage assessments and grant-request documentation required to support transfer or reimbursement of funds (i.e., most quantitative data exists because of REDI). The municipal representatives expressed the capability to provide data concerning the impacts to private property and businesses through third parties who had been assigned by the state to collect information from private property owners and businesses. However, during the meetings with the municipalities, representatives tended to have only qualitative knowledge, frequently describing the damage as severe or devastating.

Municipal staff consistently emphasized that relevant state agencies had already collected and/or synthesized much of the desired information. If not for sensitivity concerning litigation over Plan 2014, USACE staff would have conferred with the relevant state contacts and requested the information directly. Analysis of publicly-available REDI data is included elsewhere in this report.

Although most municipal staff craved information from the GLAM Committee and the ILOSLRB and welcomed the promised meeting, some municipal staff seemed disinterested in the survey. In winter of 2019-2020, shoreline communities and leaders were anticipating another year of severe flooding and wanted improved forecasts. Some inquired about technical design standards, such as appropriate elevations for new construction. Several individuals expressed concern with the technical qualifications and availability of marine contractors, and even lamented that unqualified roofing companies were implementing shoreline treatments. There was some frustration expressed about regulatory/permitting timelines and hurdles, but most individuals seemed aware of the appropriate processes and points of contact with the respective permitting agencies.

Municipal staff alluded to the most obvious damage in general terms: shoreline erosion, damage to shoreline protection, damage to private property, flooding of roads, residents and businesses, failure of drainage and sewer systems, damage to docks and marinas, and damage to natural features such as bluffs, sand bars and vegetation. They also regularly mentioned the burden on their own staff, budgets and resources, as well as the risk of delaying other routine repairs and services.

During informal conversation, municipal staff tended to focus more on the indirect impacts to their communities. Many expressed trepidation that the real estate markets were collapsing, business districts were failing, and that the tax base would be permanently affected as residents moved elsewhere and seasonal residents stayed away. Many communities feared lasting damage to their seasonal tourism industry. For many municipalities, the impacts were felt personally by their family and neighbors. Health and physical safety were often cited as main concerns, especially among the elderly.

A list of the collected points of contact and contact information will accompany this report to expedite future coordination and information-sharing. The direct email address to the Secretary for the ILOSLRB has also been provided to the meeting attendees, along with a standing invitation to reach out with questions, concerns, or information.

2.3 Meetings with Municipalities

The goal of the meetings with municipal staff was to create an opportunity for roundtable discussion and to foster an atmosphere of open communication and dialogue. The intent was to not just elicit information from the meeting participants, but also to reestablish communication channels between the shoreline communities, the GLAM Committee and the ILOSLRB. Meeting agendas and the meeting summaries are included as Appendix B. Table 2 lists the date and format of each meeting.

Task 3 of the Scope of Work required that USACE conduct data sharing meetings / site visits:

> *The USACE shall establish agendas for the meetings to include presentations from the ILOSLRB on why levels have been so high in 2017 and 2019 and from GLAM on their data collection and plan review efforts. The municipality will be asked to present information about the economic and other impacts in their local area along with the challenges addressing impacts (e.g., availability of sandbags). The USACE and municipality should focus on impacts from high water levels from Lake Ontario and the St. Lawrence River as opposed to impacts from local runoff or tributary flooding. The USACE will facilitate and moderate the discussion, prepare notes, and document impacts and concerns from the municipalities. The USACE shall also work with municipal staff on the possibility of brief site visits in conjunction with the meetings to view local damages related to the impact information discussed at the meetings. Possible participants of the site visits would include Board, GLAM, IJC staff, and USACE staff in attendance at the meetings, and up to several others identified by the IJC Project Officer. Safety of all participants would be a requirement in planning and executing any site visits. These meetings shall be held within five months of the effective date of the support order.*

The GLAM Committee prepared documents for review by the invited participants and USACE staff (hereinafter referred to as organizers) disseminated the documents as email attachments before the meetings, in order to provide context and improve the quality of communication during the meetings. The documents included presentation slides, the meeting agenda, an ILOSLRB roles and responsibilities graphic, and a list of links to information resources.

At each meeting, the U.S. Secretary for the ILOSLRB Bryce Carmichael and Alternate Regulation Representative Lauren Schifferle (hereinafter referred to as “presenters”) provided the PowerPoint presentation. The presentations were developed collaboratively by members of the GLAM Committee and updated to reflect the most recent data. Following the presentation, the agenda included time for discussion and questions.

The organizers facilitated the meetings and attempted to maintain adherence with the meeting agenda. Although the organizers intentionally designed the agenda to allow ample time for dialogue, question and answer, and municipal staff presentations, the agenda served as an important time management tool to assure that all meeting representatives had time to express themselves (as opposed to just the most vocal participants).

During the meetings, organizers described the survey (described further in Section 4), encouraged participation in the survey, and answered questions about the survey. Organizers encouraged meeting participants to provide information on critical thresholds and specific dates associated with high-impact events.

Lastly on the agenda, municipalities were offered the opportunity to describe the damages and impacts, their perceptions, and any actions taken to improve resiliency. Most participants provided succinct verbal summaries, but a few presented their own slides and more formal presentations.

Table 2: Municipal Meetings

Shoreline Communities	Date	Meeting Format
Municipalities of Monroe County	February 12, 2020	Face-to-Face
Municipalities of Niagara and Orleans County	March 9, 2020	Face-to-Face
Municipalities of Oswego County	August 17, 2020	WEBEX virtual meeting*
Municipalities of Wayne and Cayuga Counties	August 20, 2020	WEBEX virtual meeting*
Municipalities of St. Lawrence County	August 31, 2020	WEBEX virtual meeting*
Municipalities of Jefferson County	September 21, 2020	WEBEX virtual meeting*
*Four meetings were conducted virtually in response to COVID-19.		

The first two municipal meetings consisted of the envisioned roundtable format and face-to-face discussion. The Town of Greece and the Town of Carlton graciously hosted the Monroe County meeting and (combined) Niagara/Orleans Counties meeting, respectively, at their Town Halls. Figure 2 contains a photo of the meeting in the Town of Carlton. The organizers and presenters discussed minor lessons-learned after each meeting for application at future meetings (e.g., regarding time management and the agenda), but the meetings were unquestionably successful and appreciated by the municipalities. Presenters disseminated the desired information. Participants had ample opportunity to ask questions and provide input and the dialogue was healthy and productive. The final four meetings were held as virtual meetings in response to COVID-19. Although municipal representation on the virtual meetings was not quite as robust, the meetings were fairly well-attended and the dialogue was equally healthy and productive.

Figure 2: Meeting with Niagara and Orleans Counties at Carlton Town Hall.

Technical staff with the Town of Greece also hosted a short tour of impacted sites and resiliency efforts after the first meeting concluded. Other municipal representatives chose to not participate in the site visits. The organizers, in consultation with the GLAM Committee, decided to forego site visits at the remaining meetings in order to allow for more time at the respective meetings. Figure 3 includes a picture taken during the tour led by the Town of Greece.

Figure 3: A Town of Greece Technical Representative Leads a Tour of Impacted Sites and Resiliency Efforts.

2.4 COVID-19 Pandemic and Challenges

At the meeting in the Town of Carlton in March, participants were already practicing hygiene precautions and avoiding handshakes. The following week amidst the global pandemic, enforced closures within New York State, and restrictions within USACE, the GLAM Committee advised that the municipal engagement effort should be paused. The organizer sent emails to inform municipalities of the intent to indefinitely postpone the meetings, but encouraged municipalities to submit their survey responses.

In June, the GLAM Committee directed the meeting organizers to reinitiate municipal engagement efforts. GLAM Committee's initial advice was to elicit feedback from the communities regarding the acceptability of a virtual meeting and to recommend a preferred platform. Ultimately, the GLAM Committee directed the organizer to proceed with the virtual meetings in recognition that face-to-face meetings were not safe or realistic.

The organizers' email and phone communications with municipalities were not as effective as they had been in the winter and spring (e.g., contacted municipalities were less likely to respond in a timely manner, convey messages, or respond at all). Anecdotally, the diminished interest was due to local challenges and preoccupation with the virus, diminished interest in water levels and flood risk during the summer months, and personal schedules during the summer months (vacation time). In the late winter and early spring months, municipalities were hungry for information and eager to share insights as the risk of spring flooding and storms loomed. Summer marked both a return to normalcy with respect to reduced fear of water-driven impacts, and a reprioritization of attention and efforts towards the pandemic. However, sufficient feedback was received from municipalities to warrant scheduling of the remaining four meetings via virtual format. The virtual meetings were conducted on Webex and allowed for fruitful sharing of information and insights, as hoped and intended.

3 Survey Responses

3.1 Survey Response Rate

The assignment detailed in Task 4 of the scope of work is as follows:

> *The USACE will prepare an initial assessment of local economic and other impacts based on information provided by the municipalities at the meetings. The USACE shall also prepare a compilation of the challenges faced by the shoreline municipalities in addressing the impacts from the high-water events. The USACE will collate and document the information for use by the ILOSLRB and the GLAM Committee and will include lessons learned on engagement activities. These reports shall be prepared within six months of the date the contract was awarded.*

The assessment of municipal impacts was conducted by sending out surveys to each municipality ahead of our municipal meetings. The survey for Monroe County was sent out a week prior to the municipal meeting. The remaining surveys were sent out at the end of February 2020, with follow-up emails sent one week prior to each meeting. Additional follow-up emails were sent with the meeting summaries. A total of 58 questionnaires were sent out to eight counties. The questionnaires were sent to the eight county entities, one port, and 49 town municipalities. Of the 58 questionnaires, 13 were returned as of 09 December, 2020. Every county had at least one municipality that responded. Of the 13 responses, two were from counties. A breakdown of the survey responses by county is displayed in Figure 4, and the location of the municipalities that responded is shown in Figure 5. Multiple municipalities stated that they worked with their county emergency management offices to answer some of the questions in the survey.

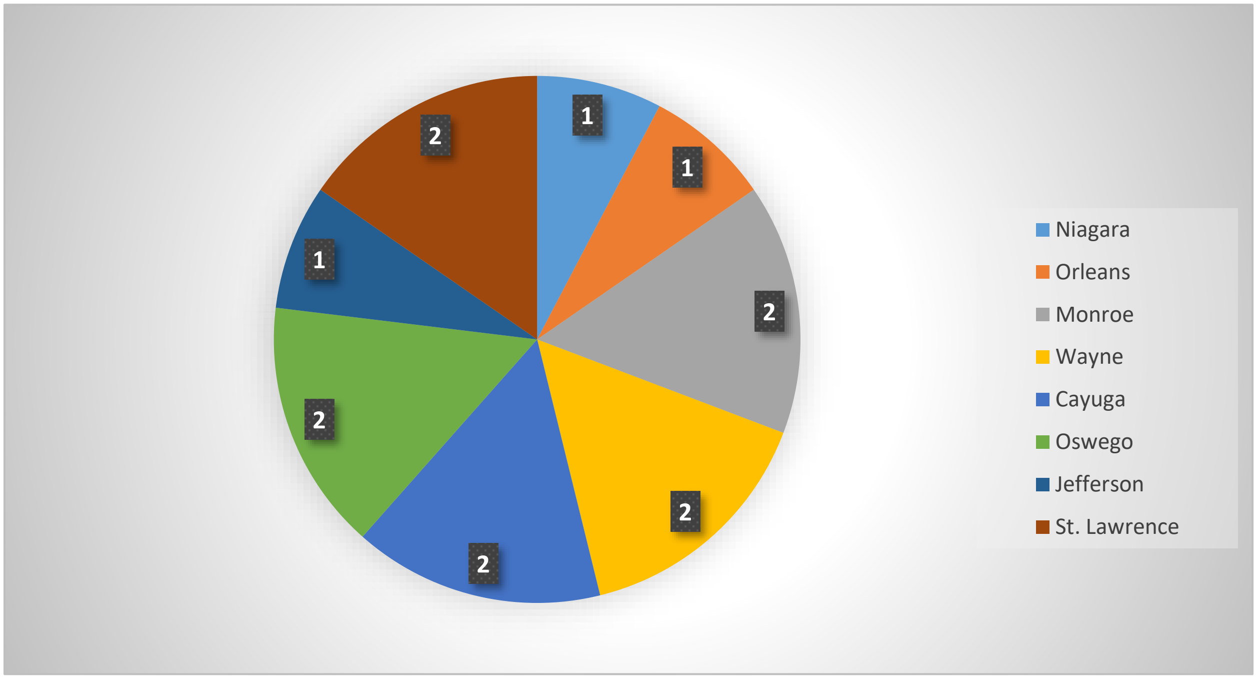

Figure 4: Survey Response by County

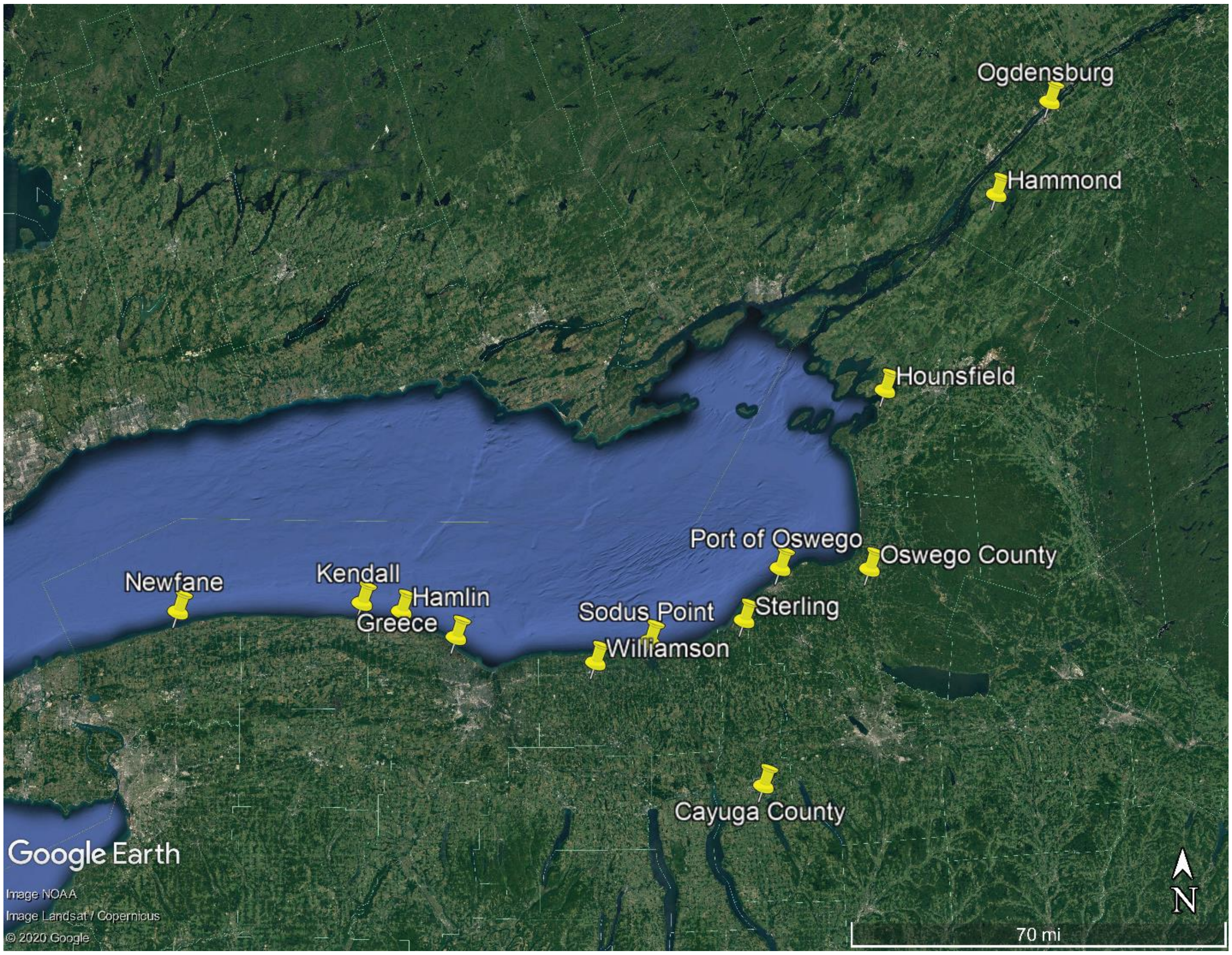

Figure 5: Location of Survey Responses

In addition to the surveys, each municipality was provided time during the municipal meetings to present any findings that they deemed significant. The majority of the municipalities that participated used this time to present data that was provided for New York State's REDI effort. As a result, the REDI projects were analyzed to consider the input provided by the municipalities. The most significant points that were made during the conversations with the municipalities were that they would like to continue ongoing communications with the GLAM Committee, most of the support for future actions and repairs to previous damages are coming from New York State REDI funding, and that more state or federal funding is required to protect shoreline properties and infrastructure.

3.2 Major Impacts to Municipal Infrastructure

The primary purpose of the surveys was to capture impacts to municipal infrastructure, record mitigation measures taken by the municipalities to prevent future damages and recognize the threshold water level at which impacts start occurring. Of the 13 responses by municipalities, eight recorded impacts to municipal infrastructure, and five recorded impacts to shore protection structures. The five municipalities that recorded damages to shore protection structures also recorded damages to municipal infrastructure. Five municipalities that provided responses did not record any impacts to shore protection structures or municipal infrastructure. Figure 6 shows the recorded damage to municipal infrastructure during the 2019 high water events by county based on the 13 survey responses. Note that the damages shown for Cayuga County were recorded by the entire county. Additionally, the damages indicated as “other” for Oswego County were damages is associated with the Port of Oswego, while the damages indicated as “other” for Niagara County were not recorded.

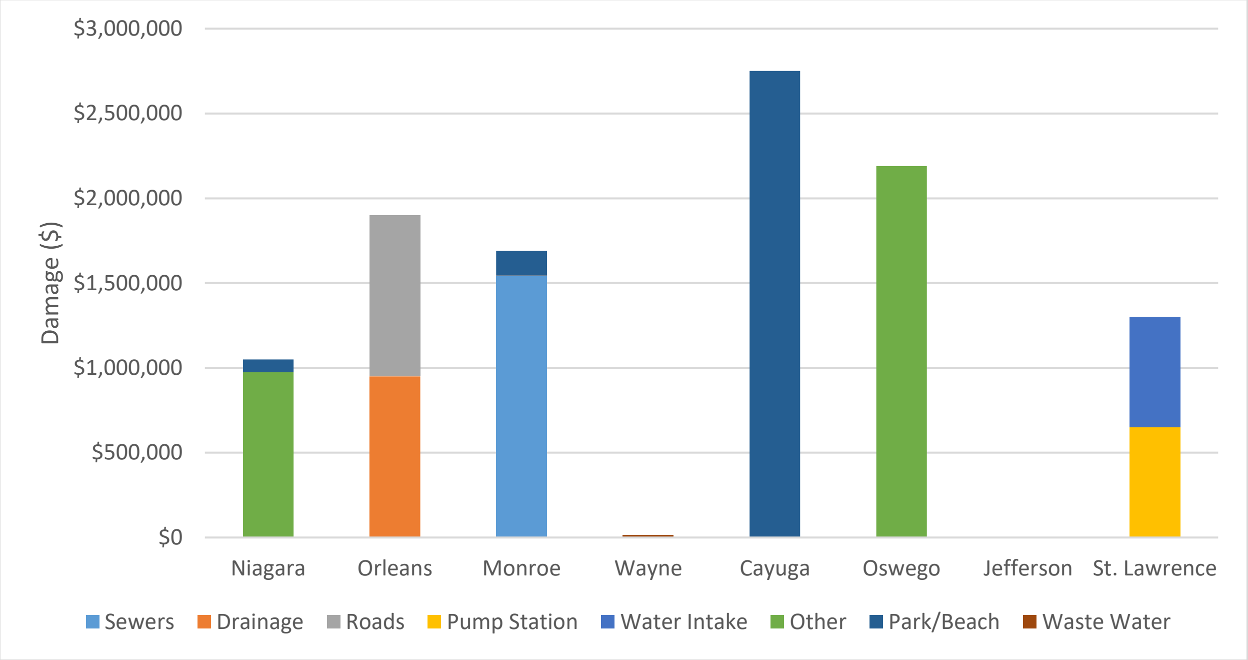

Figure 6: Damage to Municipal Infrastructure by County (n=13)

The average cost of damage recorded by municipalities responding to the survey was approximately $1,256,000, with the minimum being $4,000 for drainage pipes, and the maximum being approximately $2.8 million for damages to parks and boat launches. Survey responses do indicate that likelihood of damages occurring to municipal infrastructure is less than the likelihood that damages occur to shoreline industry and businesses (Figure 7).

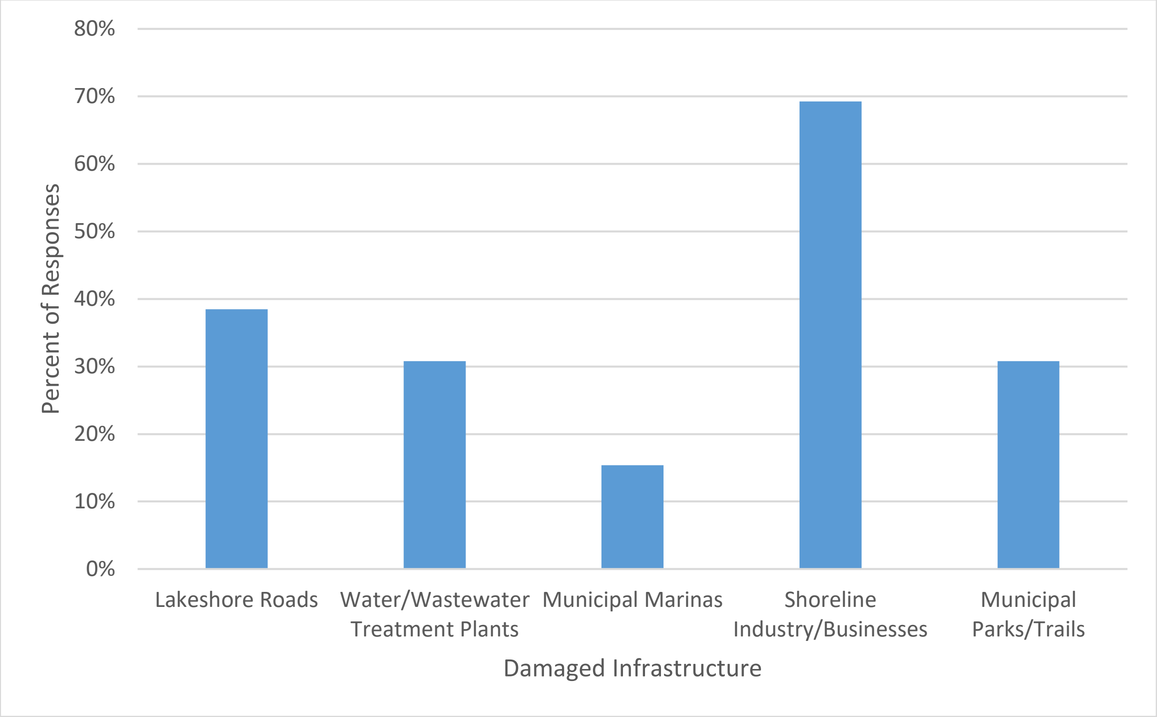

Figure 7: Municipal Responses to Impacts (n=13)

Out of the 13 municipal responses, six have shore protection structures that experienced damage in 2017 and/or 2019. The average cost of damage in 2017 was $264,000, while the average cost of damage in 2019 was $496,000. Five of the six municipalities that recorded damages to shore protection structures experienced damages in both 2017 and 2019, while the other municipality only experienced damage in 2019. Multiple municipalities stated that the shore protection structures were not able to be repaired between 2017 and 2019, which is likely a reason for the higher damages in 2019. Eight of the 13 municipalities indicated they plan to build new shoreline structures (Figure 8).

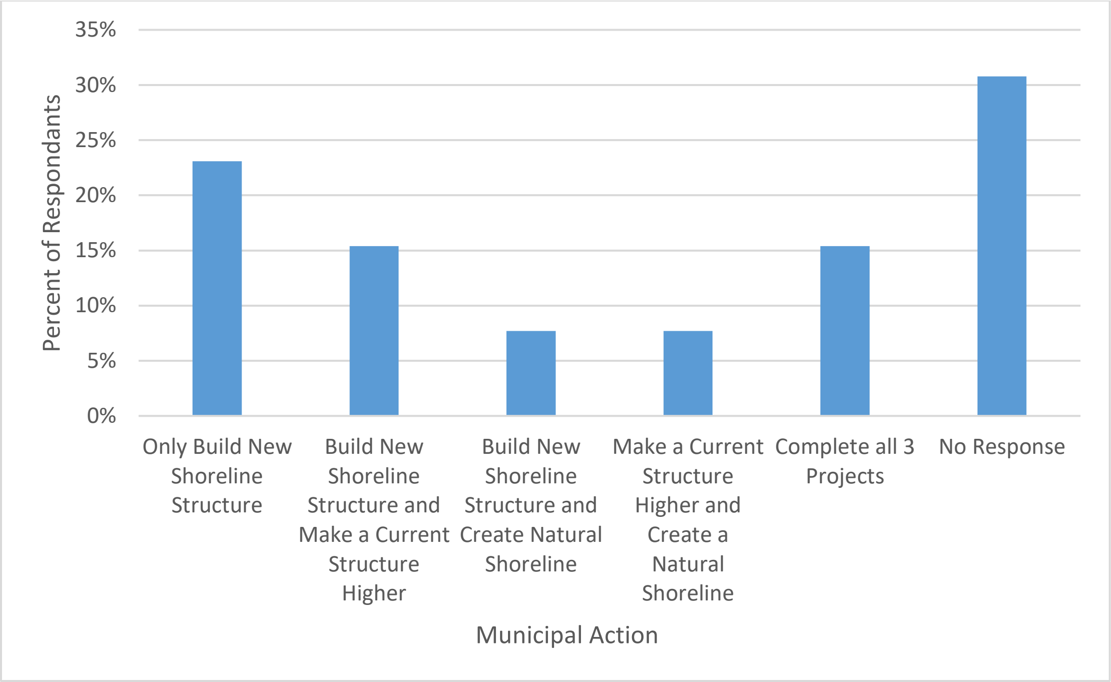

Figure 8: Plans for Municipal Shoreline Protection Structures (n=13)

3.3 Mitigation Measures

The measures used by municipalities varied by year. As shown in Figure 9, all but two of the municipalities that responded took actions to mitigate the high-water damages in 2017. Of the 11 municipalities that took actions, the most common action was sandbagging, which all 11 municipalities took. The municipalities spent, on average, over $91,000 on sandbagging. In 2019, 12 municipalities took mitigation actions, but sandbagging was only used by eight municipalities, instead of 11. The actions taken in 2019 appear to be more permanent actions, such as purchasing pumps and installing exterior flood walls. Table 3 and Table 4 show the expenditures municipalities made, by action and by county. The information displayed in Table 3 and Table 4 only reflect expenditures to the 13 municipalities that responded to the survey, and are not indicative of each entire county. There appears to be a consistent decrease in spending between 2017 and 2019 for all counties. Additionally, there appears to have been more spending on the south-western shore, from Niagara County to Wayne County. Note that while Figure 6 shows that the two responding municipalities in Wayne County experienced minimal damages to municipal infrastructure, there were significant costs associated with mitigation measures. This likely occurred because the municipality spent a significant amount of money to protect private properties. For example, Sodus Point, located on Sodus Bay, has many properties used as summer cottages, which the municipality helped protect. While municipalities took action between the 2017 and 2019 high water events, most of the funding came from the state and federal level. As a result, an analysis of REDI projects was conducted, shown in Section 4.1 .

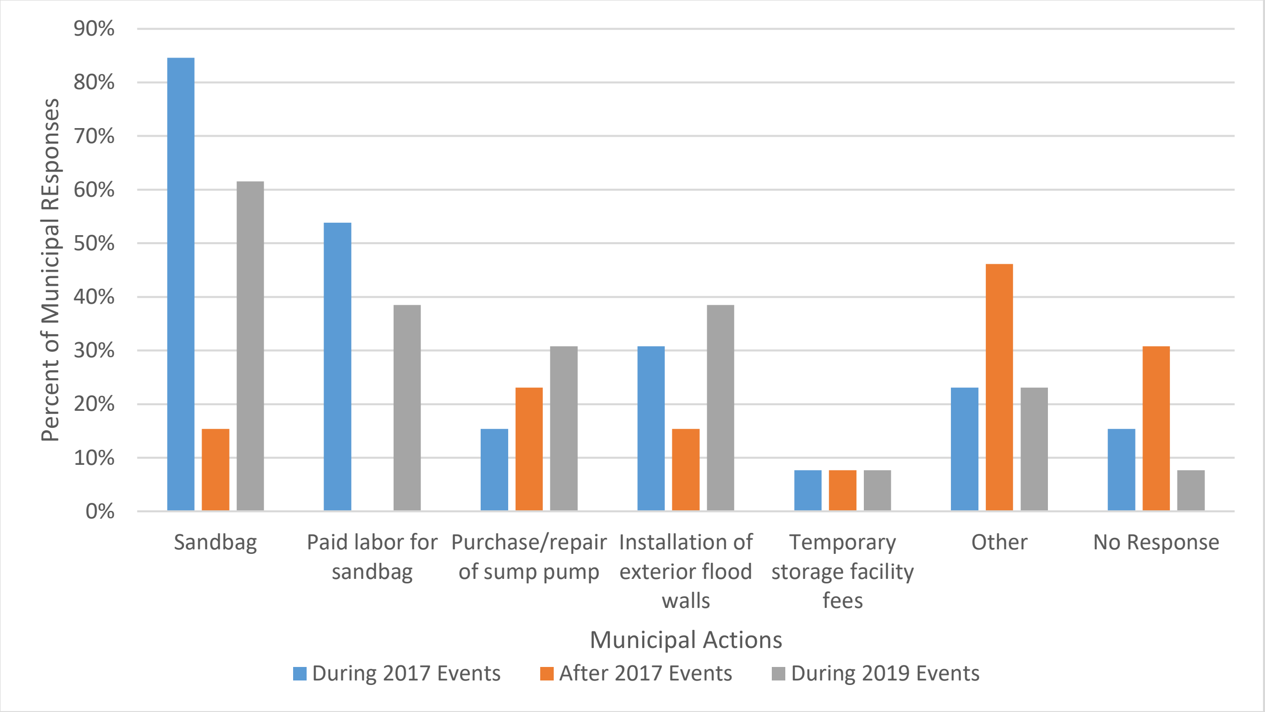

Figure 9: Mitigation Measures Taken (n=13)

(Municipalities may have taken multiple measures)

Table 3: Spending for Measures Taken by Responding Municipalities During 2017 Events

Measure	Niagara County	Orleans County	Monroe County	Wayne County	Cayuga County	Oswego County	Jefferson County	St. Lawrence County
Sandbag	$75,000	$212,815	$112,000	$138,000	$100,000	NA	NA	NA
Paid labor for sandbag	$40,000	$0	$218,000	$1,200,000	NA	$0	$0	$2,000
Purchase/repair of sump pump	$25,000	$0	$0	$5,000	$0	$0	$0	$0
Installation of exterior flood walls	$0	$0	$160,000	NA	$0	$0	NA	$0
Temporary storage facility fees	$0	$0	$50,000	$0	$0	$0	$0	$0
Other	$0	$0	$80,000	$400,000*	$0	$0	$0	$0
Total	$140,000	$212,815	$620,000	$1,743,000	$100,000	$0	$0	$2,000

* The town of Sodus Point spent $400,000 for pumping out sewer.

1. $0 indicates that the measure was not taken by the county.
2. NA indicates that either the measure was taken and the municipality didn't receive funding, or the survey response did not provide monetary values for measures.
3. Cayuga and Oswego counties represent the county's responses. All other counties represent individual municipalities that responded to the surveys and are not indicative of entire county's responses.

Table 4: Spending for Measures Taken by Responding Municipalities During 2019 Events

Measure	Niagara County	Orleans County	Monroe County	Wayne County	Cayuga County	Oswego County	Jefferson County	St. Lawrence County
Sandbag	$40,000	$120,500	$100,000	$40,000	NA	NA	$0	NA
Paid labor for sandbag	$35,000	$0	$190,000	$0	$0	NA	$0	$0
Purchase/repair of sump pump	$0	$0	$50,000	NA	$0	NA	$0	$0
Installation of exterior flood walls	$0	$0	$115,000	NA	$0	$0	NA	$0
Temporary storage facility fees	$0	$0	$50,000	$0	$0	$0	$0	$0
Other	$0	$0	$15,000	$0	NA	NA	$0	$0
Total	$75,000	$120,500	$520,000	$40,000	$0	$0	$0	$0

1. "NA" indicates that the measure was not taken by the county.
2. $0 indicates that either the measure was taken, and the municipality didn't receive funding, or the survey response did not provide monetary values for measures.
3. Cayuga and Oswego counties represent the county's responses. All other counties represent individual municipalities that responded to the surveys and are not indicative of entire county's responses.

3.4 Additional Impacts

The surveys sent out to the municipalities included some qualitative questions, which were intended to allow the municipalities to include additional impacts that were not specifically indicated in the quantitative questions. Based on survey responses, along with conversations during the municipal meetings, municipalities appear to have access to significant data on damages to private property owners. This information was likely collected when the municipalities were submitting damages to New York State for REDI funding. The survey included multiple questions to record impacts to private property owners. Figure 10 shows the damage to properties from flooding for each county, and Figure 11 shows the damage to properties from erosion for each county. While Jefferson County did collect information from private property owners, Oswego County did record information, but did not provide monetary damages. Monroe and Wayne Counties recorded significant damages from flooding, because the municipalities that responded in these counties are low lying counties located around bays. Meanwhile, municipalities stated that erosion was most significant on the south-eastern shore of Lake Ontario, due to the lake's current. As a result, Cayuga and Oswego Counties are more likely to experience impacts due to erosion.

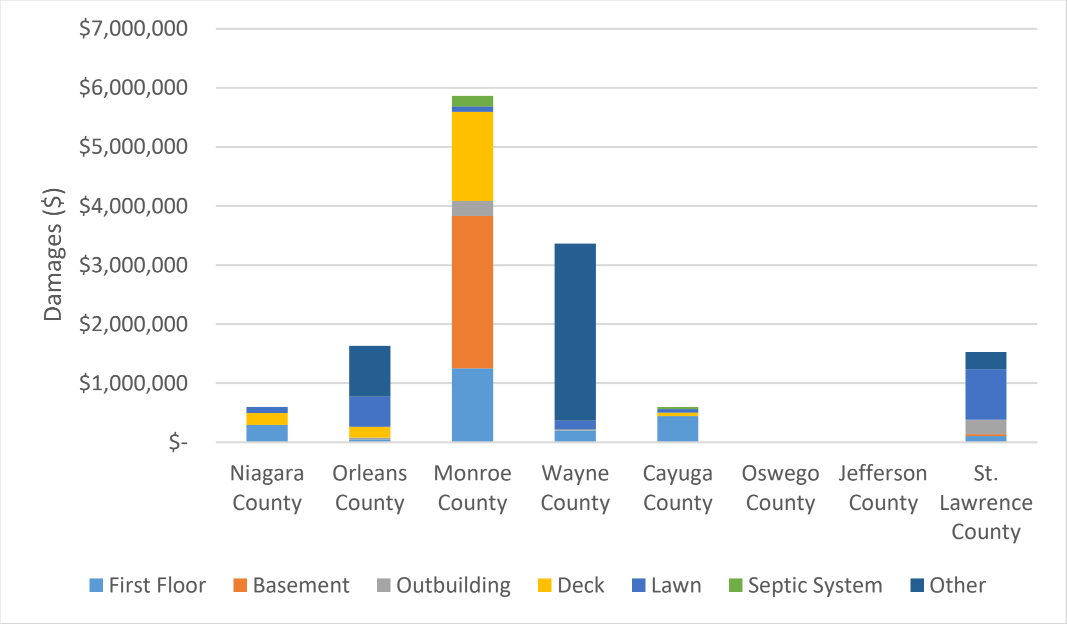

Figure 10: Damages to Shoreline Properties from Flooding

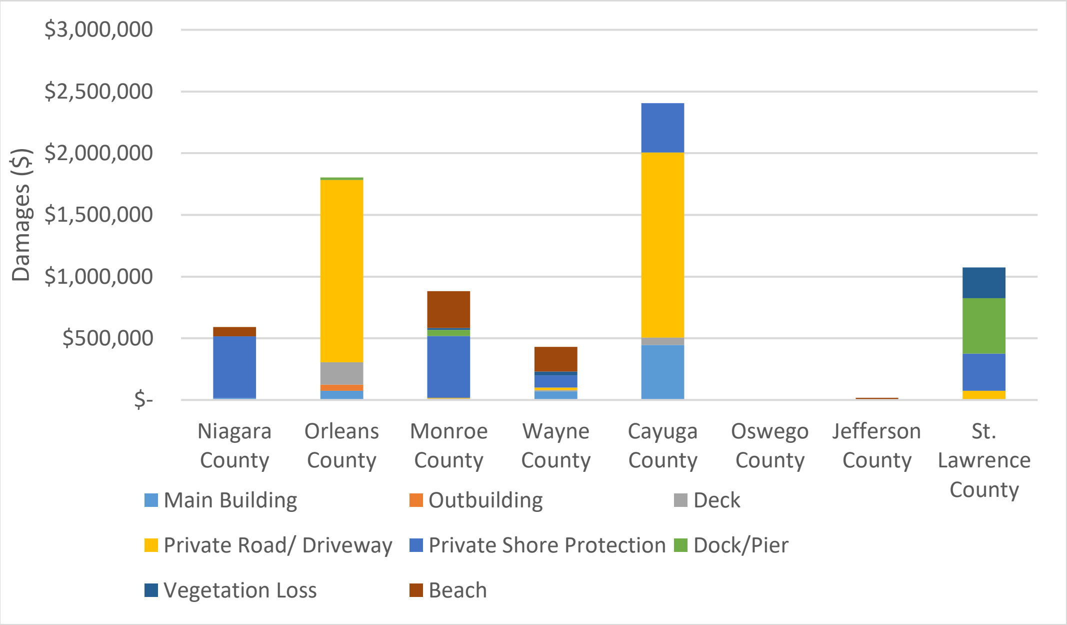

Figure 11: Damages to Shoreline Properties from Erosion

Municipalities were also asked to describe impacts due to ice. The five counties along the southern shore of Lake Ontario (Orleans, Monroe, Wayne and Cayuga Counties) indicated impacts due to ice. The remaining counties (Oswego, Jefferson and St. Lawrence Counties) did not record impacts from ice. Descriptions included damages to properties, drainage and shore protection structures.

4 Supplementary Analyses

The objective of the survey was to record impacts to municipal infrastructure, mitigation measures taken and critical thresholds. However, conversations with municipalities indicated additional resources that could be used to assess the impacts and measures taken by municipalities. Additionally, a relatively small proportion of municipalities completed the survey and responses to critical thresholds were not conclusive, resulting in the need for additional analyses to better understand impacts at incremental water levels.

4.1 REDI Projects

The data collected about REDI projects was available to the public on the NYS.gov website. This data was organized and aggregated by project type and by region and displayed in the following figures. A significant majority of REDI projects are for shore stabilization projects (Figure 12), and funding was received by every shoreline county. Shore stabilization projects also constitute the most funding received by all of the counties (Figure 13). Appendix C provides a greater description of the projects for each county.

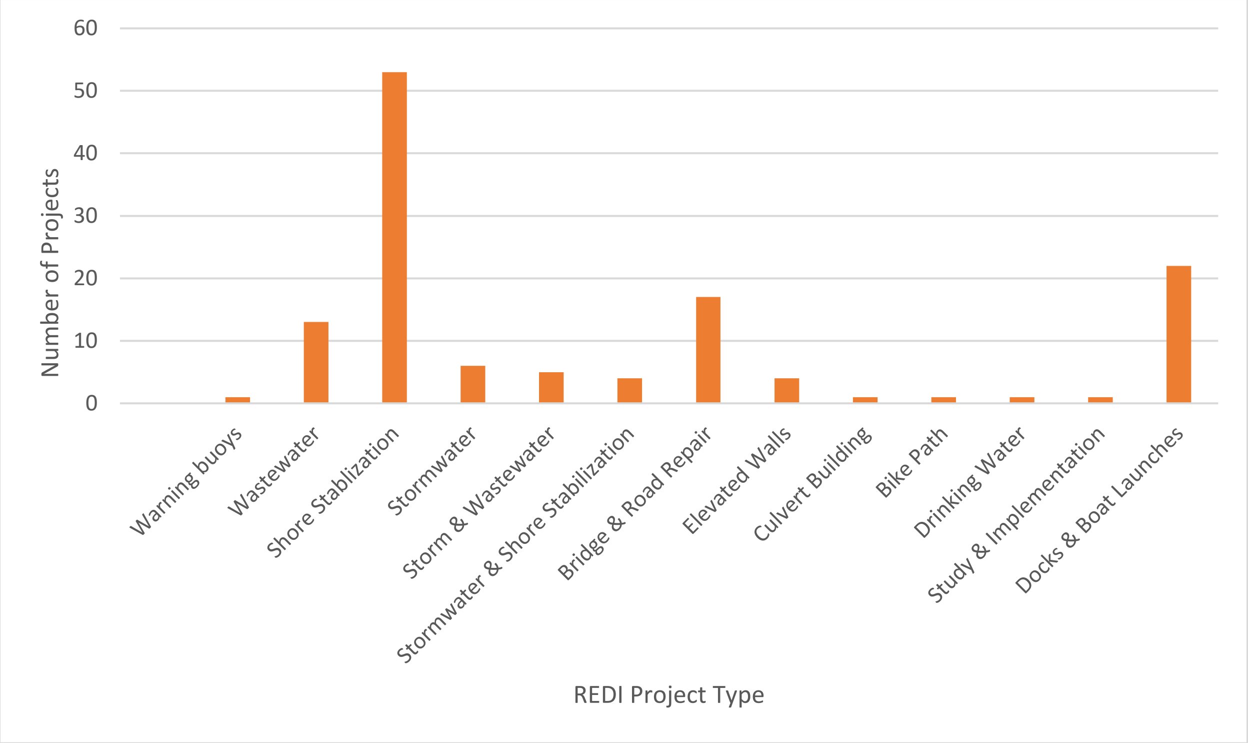

Figure 12: Number of REDI Projects by Project Type

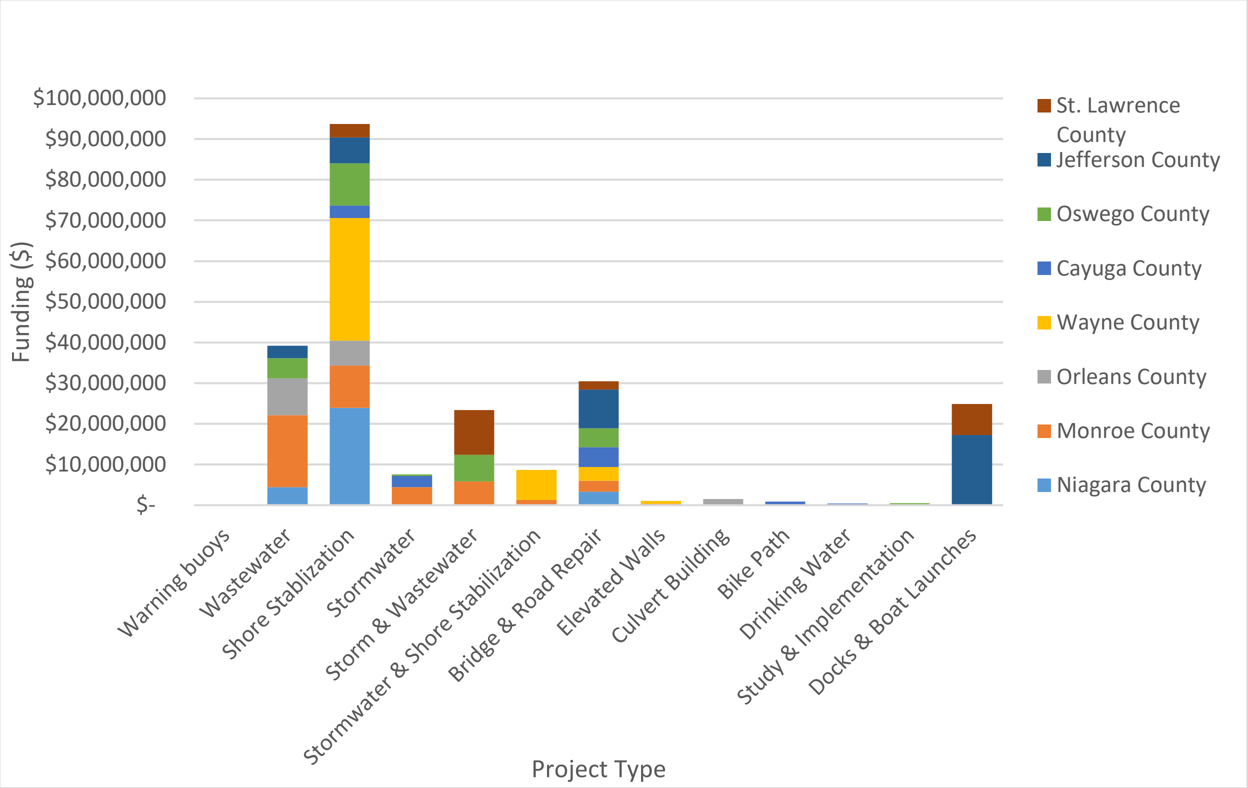

Figure 13: REDI Funding by Project Type

50 percent of funding was received by Niagara, Monroe and Wayne Counties (Figure 14), which makes up approximately 70 percent of the U.S. shoreline population. The two largest project types for these counties are shore stabilization projects and projects associated with wastewater facilities (Figure 15). There does appear to be a difference in funding received by Jefferson and St. Lawrence Counties. These counties are the only counties that received funding for docks and boat launches (Figure 15). The difference in project type by region is likely attributed to the fact that the southern shore of the lake receives significant wind and wave action, so these regions require additional protection from potential erosion. Meanwhile, the counties along the St. Lawrence River experience a greater variance in water levels, so improvements to docks and boat launches, such as floating docks, helps extend the season for marinas.

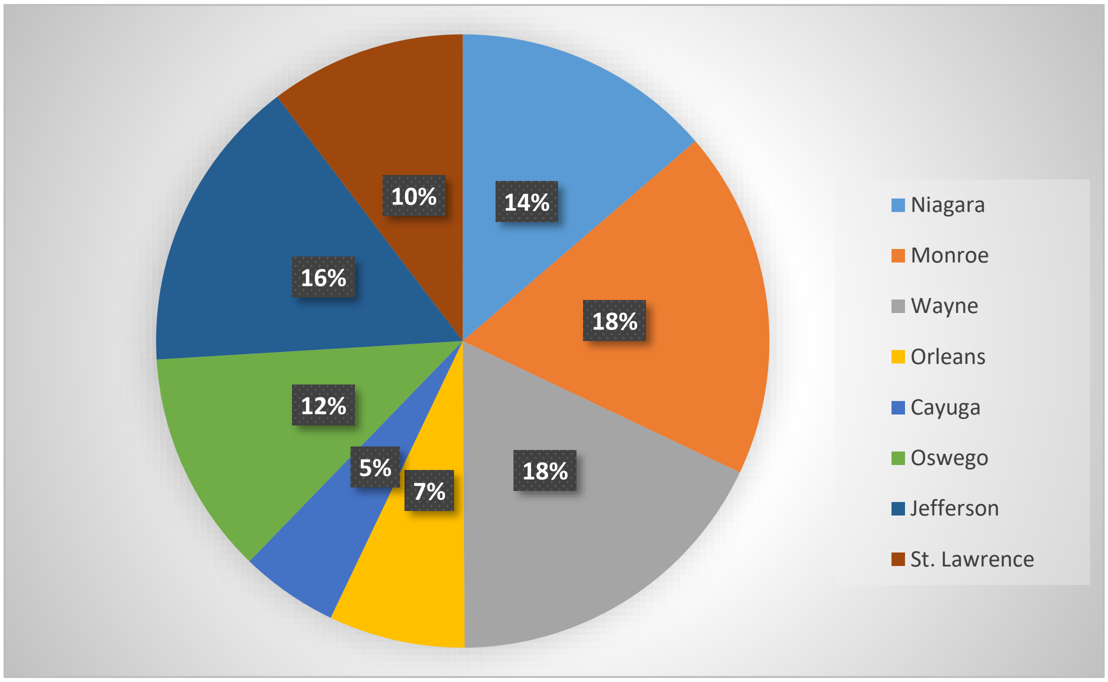

Figure 14: REDI Funding by County

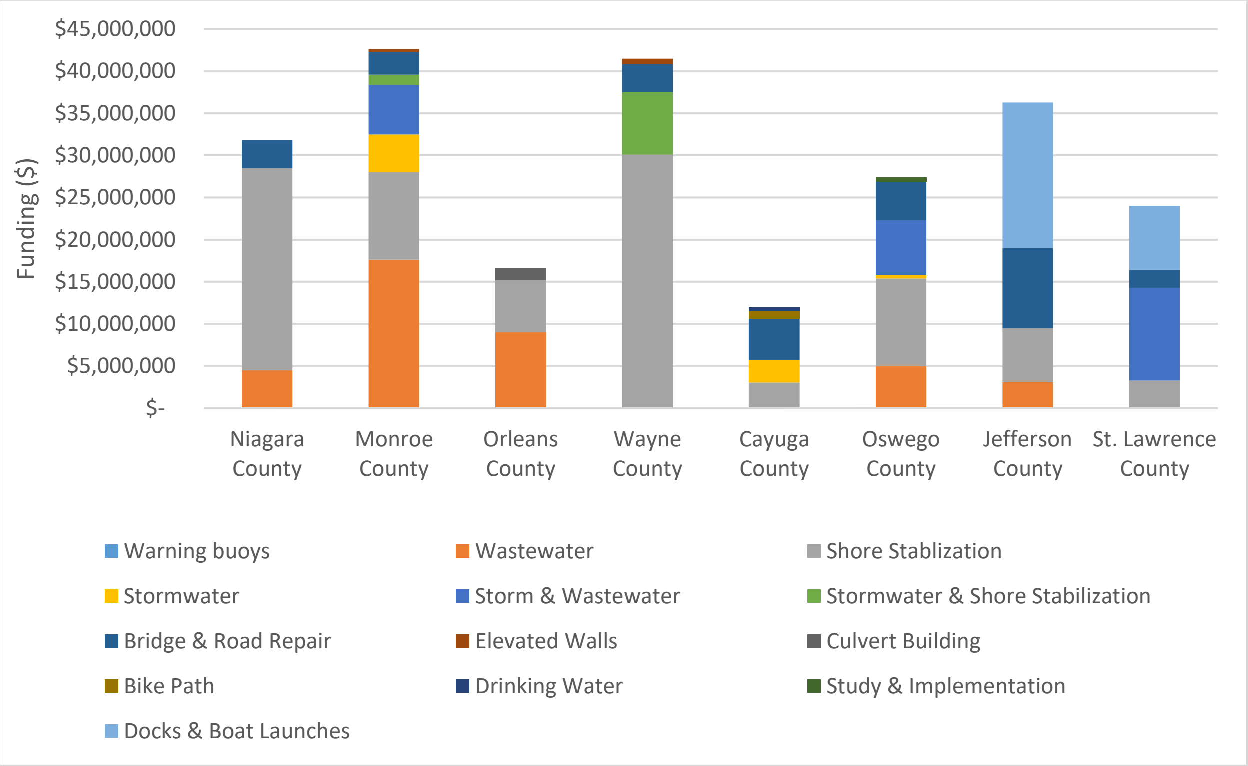

Figure 15: County REDI Funding by Project Type

4.2 Critical Thresholds

Responses to when impacts occurred to different infrastructure were lacking, as most municipalities only stated the month and year, and not a specific date. The approach of identifying dates on which impacts occurred to each municipality and linking the dates with the associated water level may have been more effective if the survey was conducted using a survey program. By using a program, the respondent would be required to input a specific date, and a question would be asked about whether the given date was an estimate, or a known value.

Since the responses pertaining to impacts were uninformative, an analysis was conducted to estimate the water levels that municipal infrastructure is impacted. This analysis was coarse and beyond the scope of the task, and therefore multiple assumptions were made. There are multiple analyses being conducted on similar geographic scopes which have a greater level of detail and will likely have more accurate results. As a result, the output produced by the analysis discussed in this section should be used alongside the output produced by other analyses based on a clear understanding of the data and assumptions used for the various approaches.

The analysis performed for this task pulled municipal parcel and street data from a public NYS database, and linked the parcel data with 2018 30m Digital Terrain Model (DTM) data from the United States Geological Survey's (USGS) 1 arc-second National Elevation Dataset (National). The NYS parcel data provides a property classification code, indicating the use of each parcel. The parcels used for this analysis are "Equipment and Other Facilities for Fire, Police, Civil Defense, etc.", "Roads, streets, highways and parkways, express or otherwise (if listed) including adjoining land" and "Property used to provide services to the general public"[1]. These parcels were used to reflect municipal structures. The analysis identifies structures that may be impacted at various water levels. This analysis has three assumptions. The first, is that the structures will be impacted at ground elevation. An example of a structure that experiences impacts prior to the water reaching the given ground elevation would be wastewater treatment plants. The second assumption is that structures will first be impacted when water levels are two feet below the ground elevation for Lake Ontario structures, and one foot for the St. Lawrence River, due to wave action. Waves may be higher during storm, which could result in impacts prior to the given water levels. The final assumption is that there are no shoreline structures to protect the impacted structures. Based on Figure 16 and Figure 17, there appears to be an increase in impacted structures and roads along Lake Ontario around 247.3 feet (75.37 meters) IGLD85[2]. Note that the structures that are impacted near 246 appear to be impacted at those levels because of the assumption that impacts will occur when water levels are two feet below ground elevation due to wave action. Lake Ontario reached 247.3 feet on 16 April, 2017, and again on 29 April, 2019. While no dates were specified, municipal responses did indicate that impacts began in April 2017 and May 2019. Additionally, Figure 18, Figure 19, Figure 20 and Figure 21 show an increase in impacts to structures and roads around the Moses Saunders dam around 190 feet (57.91 meters).

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[1] https://www.tax.ny.gov/research/property/assess/manuals/prclas.htm#community

[2] International Great Lakes Datum (IGLD) is the reference system by which Great Lakes-St. Lawrence River Basin water levels are measured. The reference zero point of IGLD 1985 is located at Rimouski, Quebec.

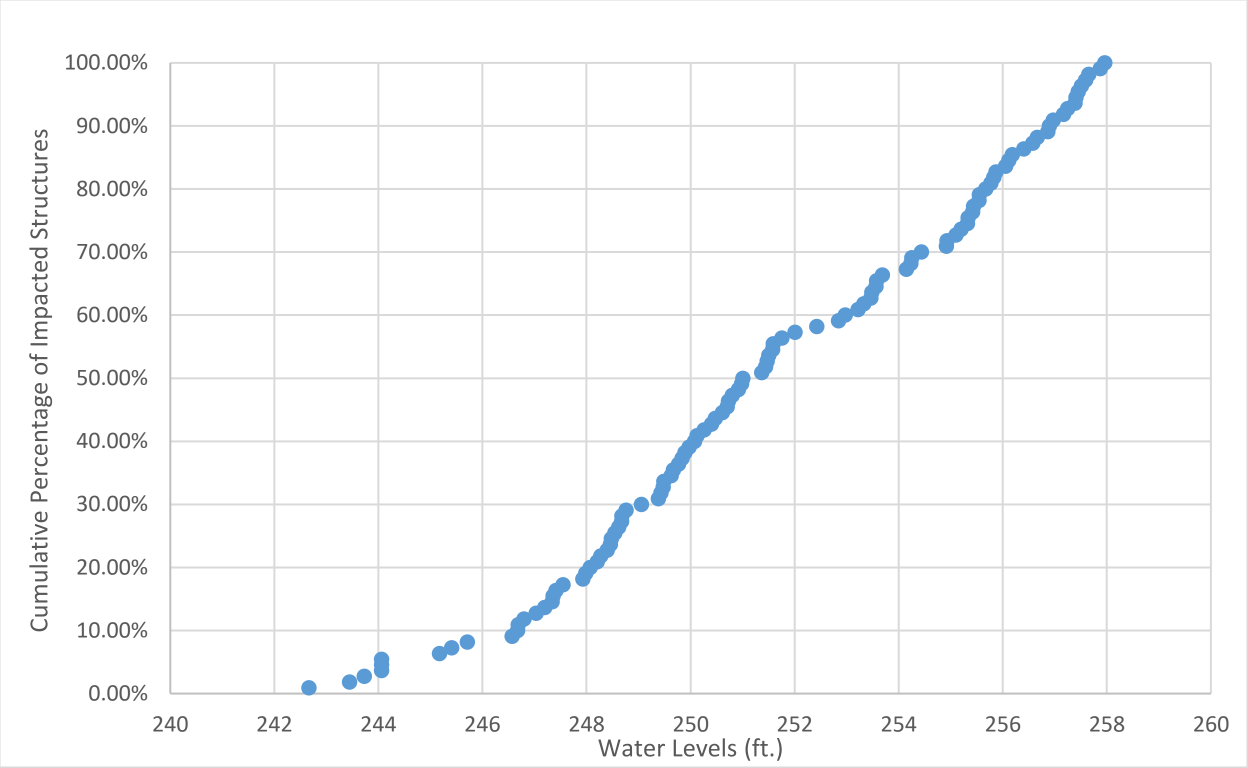

Figure 16: Cumulative Percentage of Impacted Structures by Water Level on Lake Ontario

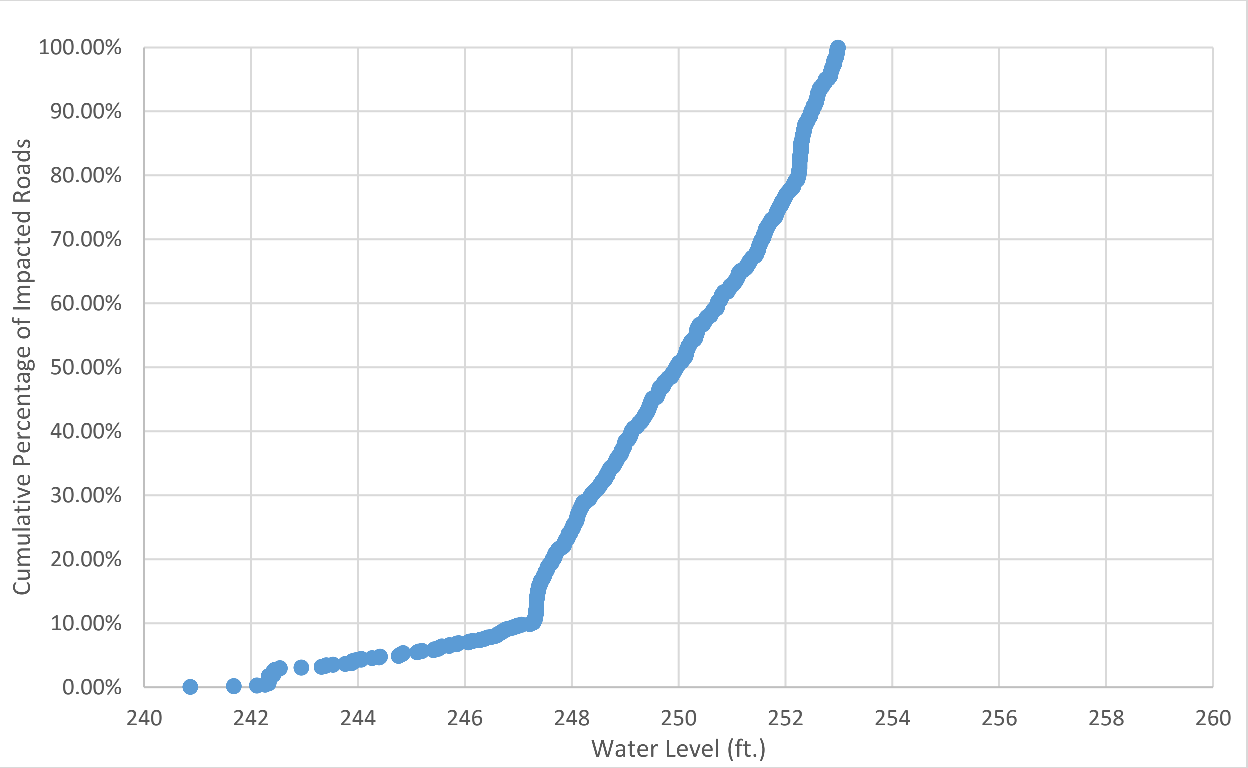

Figure 17: Cumulative Percentage of Impacted Roads by Water Level on Lake Ontario

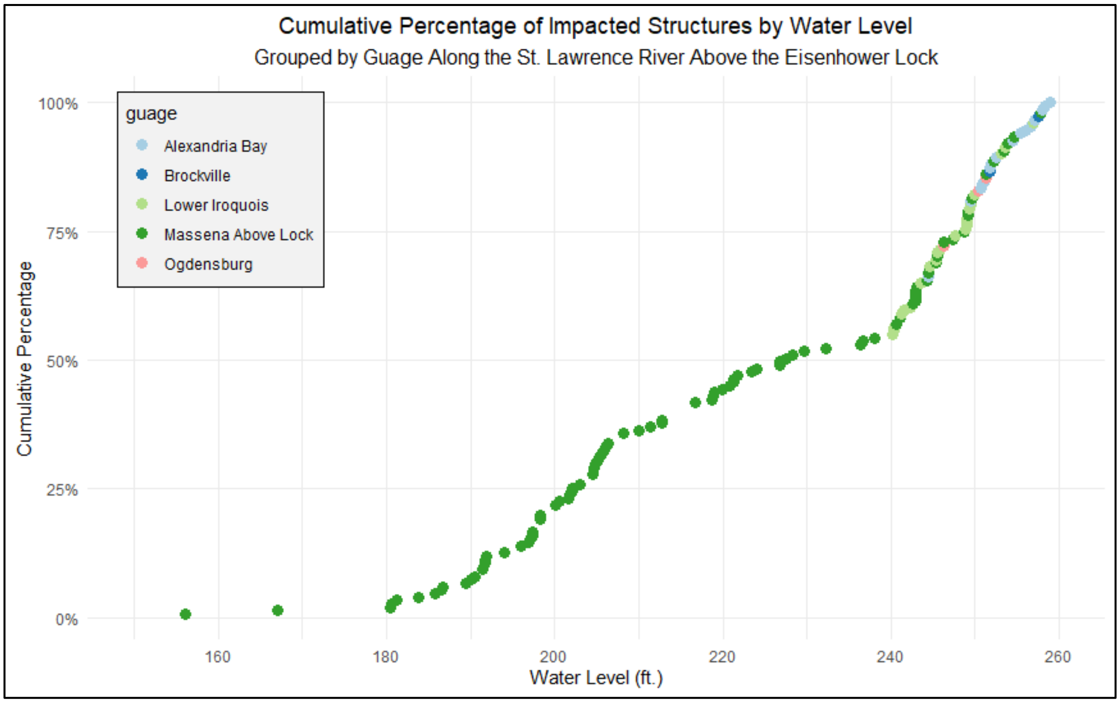

Figure 18: Cumulative Percentage of Impacted Structures Along the St. Lawrence River Above the Eisenhower Lock

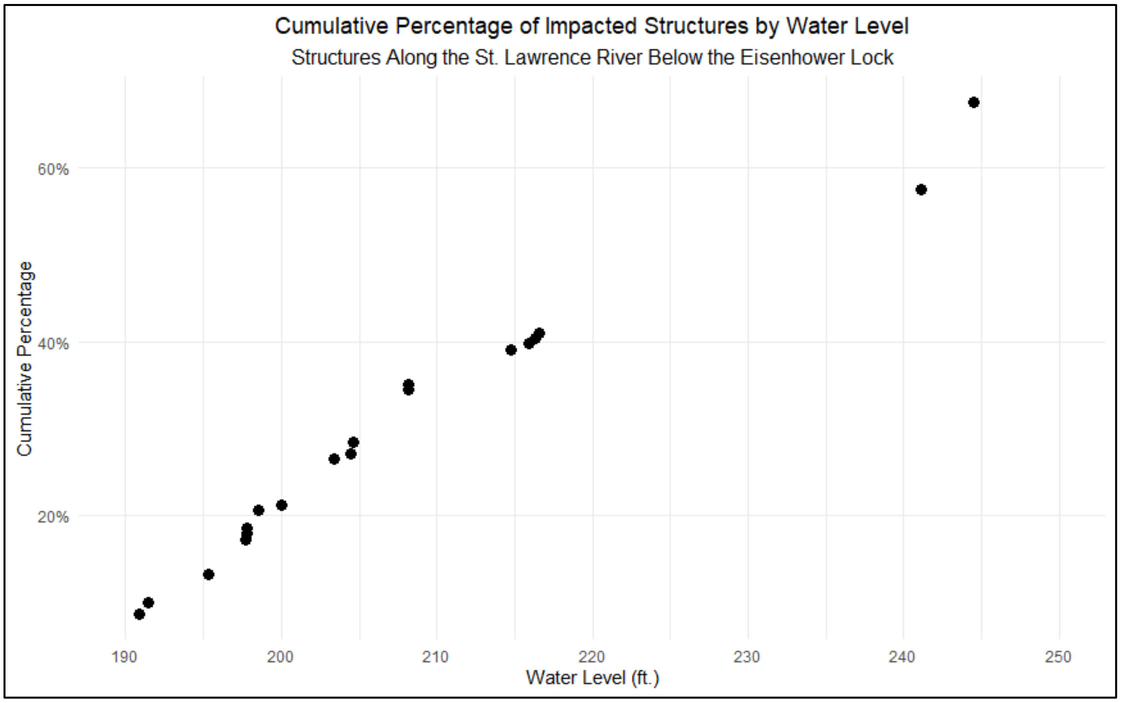

Figure 19: Cumulative Percentage of Impacted Structures Along the St. Lawrence River Below the Eisenhower Lock

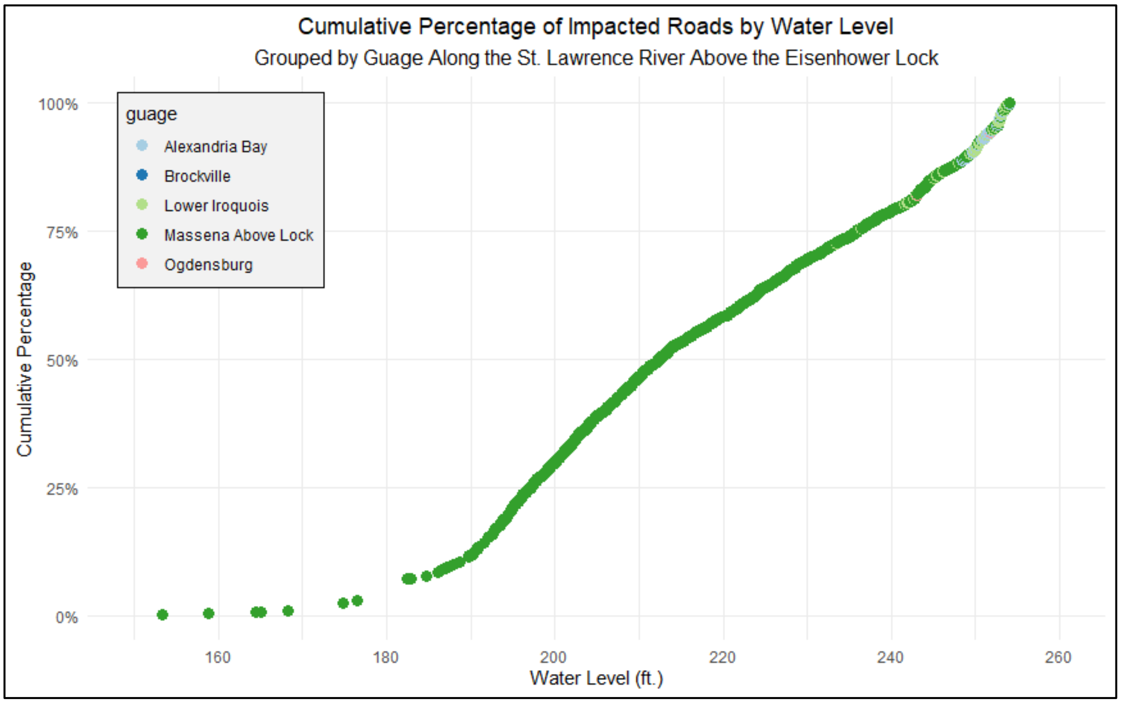

Figure 20: Cumulative Percentage of Impacted Roads Along the St. Lawrence River Above the Eisenhower Lock

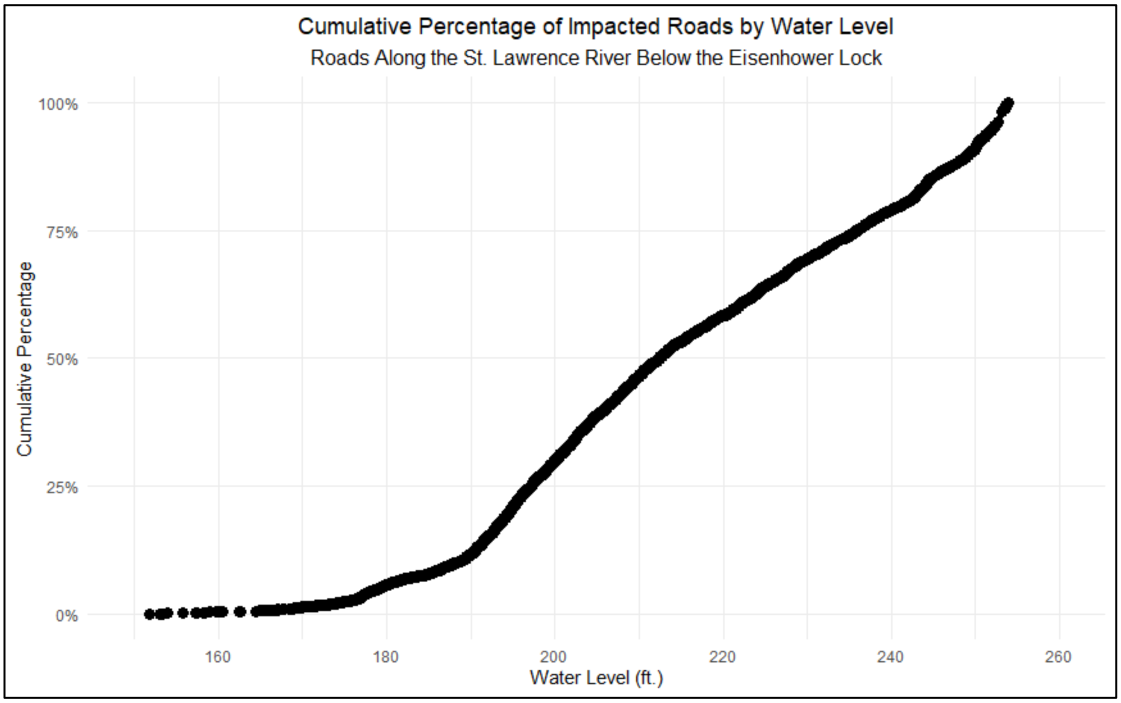

Figure 21: Cumulative Percentage of Impacted Roads Along the St. Lawrence River Below the Eisenhower Lock

4.3 Additional Analyses

This effort by USACE to document municipal impacts from high water conditions on Lake Ontario and the upper St. Lawrence River is one piece of a broader effort by the GLAM Committee that will collectively support the assessment of potential critical water level thresholds along the shoreline. For example, complementary efforts to engage municipal staff within the Province of Ontario and the Province of Quebec in Canada are also being undertaken and nearing completion, gathering similar information to this USACE effort. As well, a secondary effort from USACE has been looking at local impacts to recreation and tourism opportunities along the shoreline during recent high water periods. That team has been organizing data at a U.S. County scale. While the work may not initially allow for the identification of critical thresholds, it will be a basis to focus further work that will support threshold identification for shoreline recreational and tourism activities.

In addition to the efforts by USACE, the GLAM Committee itself has undertaken some direct data acquisition following the 2017 and 2019 high water period. After 2017, the GLAM Committee undertook both a marina/yacht club and municipal and industrial water user survey to gather information from those specific sectors about the nature and extent of water impacts (https://ijc.org/en/glam/questionnaire/other). In addition, aerial imagery was acquired along the U.S. shoreline of Lake Ontario by USACE in 2017 during the high water period and that imagery was reviewed to identify critical inundated areas along the shoreline. The GLAM Committee also established an online questionnaire for shoreline property owners along the Lake Ontario and St. Lawrence River shoreline following the 2017 and 2019 high water periods. Impact reports from the online questionnaire have been summarized and fact sheets are available (https://ijc.org/en/glam/questionnaire/highlights).

More recently, the GLAM Committee is supporting work by coastal engineering staff from USACE Detroit District to characterize potential inland extent of flooding using a combination of offshore, nearshore, and onshore wave modelling, recent high resolution elevation data and building location. The effort will refine the range of potential impacts to shoreline buildings under different water level and storm conditions and will contribute to the identification of local and regional impact thresholds.

Collectively, the GLAM Committee will be using information from this USACE municipal engagement effort along with the range of other sources to support the development of impact zones within different shoreline communities. These impact zones are an attempt to define critical local water level thresholds by combining impact information from the various sources along with supplementary information where available. The GLAM will use the initial attempts at defining critical water level thresholds to identify critical data and information gaps to guide future efforts.

5 Lessons Learned

Through this task, USACE staff noted lessons that may be applied to improve future studies. During the outreach effort, some unexpected adjustments had to occur due to COVID-19. The attendance rate of the virtual municipal meetings was not as high as the in-person municipal meetings that were held prior to COVID-19. There are several potential reasons for the decreased attendance rate: a lack of confidence in technology and the virtual format, a shift in focus towards COVID-19, personal (vacation) scheduling conflicts and a decreased concern for high-water events during the summer when the virtual meetings were held. These virtual formats did not severely impact the overall effectiveness of the municipal meetings. The likelihood of a similar, public health-related occurrence in the near future is low. However, it is worth noting that municipal interest in the subject matter is likely to be higher during winter and early spring months, as communities prepare for a rise in water levels, and that participation rates are likely to be greater at in-person meetings.

Another challenge encountered during the task was the low response rate to the surveys that were sent out to the municipalities. This may have been slightly impacted by COVID-19 and the decrease in attendance to the municipal meeting. However, the surveys were sent out to all municipalities prior to the municipal meetings, and they all had extensive opportunity to provide their responses. Some municipalities did provide some feedback concerning the survey and their ability to answer all of the questions, indicating that the survey may have been too long and time intensive. Additionally, some municipalities expressed their confusion with this survey, since there was another survey sent out by the GLAM Committee, which targeted private property owners, as well as a survey with similar questions that was sent by New York State. As a result, it is recommended that future tasks start with coordination with New York State to receive as much information as possible. Additionally, it is recommended that future surveys are limited to approximately ten questions, which will appear less intimidating to the respondents, and potentially increase response rate.

Finally, one of the most difficult pieces of data to acquire, was critical thresholds. There was significant thought that went into the acquisition of critical thresholds for this survey, due to past complications with similar data. In previous surveys, respondents were asked to provide the water level at which impacts were first experienced. This resulted in a wide variance of water levels, since it is difficult for shoreline municipalities to determine the water level at their respective location. As a result, this survey intended to ask respondents for the date that impacts were first recorded, which will correspond to a water level for that given data. Ultimately, the respondents did not provide detailed dates, and most only provided a month and year. For future surveys, it is recommended that an online survey program be used, which will allow more control on the type of answers that are received.

6 Conclusion

Based on survey responses, most municipalities experienced some form of damage to infrastructure during the 2017 and/or 2019 high water events. The type of infrastructure that was impacted was mixed and may be inconclusive due to the limited survey responses. However, approximately 85 percent of the municipalities that responded to the surveys took some form of action to help prevent damages, and New York State is helping municipalities build better protection, with the use of REDI funds. It is recommended that coordination with New York State occurs in the future to receive additional information about the state’s actions, as well as additional data that was collected by the municipalities.

Survey responses do indicate that the damage to municipal infrastructure is only a fraction of the damage that occurred to shoreline industry and businesses. Municipalities also indicated that a significant concern was the ability to properly prepare and protect private property owners and businesses from future flooding events. Conversations during the municipal meetings indicate that there is concern with the current method of forecasting water levels, because the uncertainty associated with the forecast can provide a false sense of security, which impacts the level of preparation that the shoreline municipalities take each spring. Municipalities are hopeful that communication with the GLAM Committee will continue, which will help them better understand actions that the IJC are taking, and help the municipalities better prepare for the possibility of future high-water events.

7 References

Great Lakes- St. Lawrence River Adaptive Management Committee (2018). *Annex 1: Supplementary Impact Assessment Information for Lake Ontario and St. Lawrence River*

Great Lakes- St. Lawrence River Adaptive Management Committee (2018). *Summary of 2017 Great Lakes Basin Conditions and Water Level Impacts to Support Ongoing Regulation Plan Evaluation*

International Joint Commission (2014). *Lake Ontario- St. Lawrence River Plan 2014.*

LURA Consulting (2019). *High Water Impacts Research on Lake Ontario and St. Lawrence River- Municipal and Industrial Water Users*

"National Geospatial Program." The National Map, www.usgs.gov/core-science-systems/national-geospatial-program/national-map.

Appendix A: Review of 2017 Impacts and Findings

1. Review of 2017 GLAM Assessment

After the high water levels of 2017, the GLAM Committee conducted an initial assessment to determine the impacts that were caused by extreme water levels (Great Lakes, 2018a). Some impacts expected with high water levels include, flooding of municipal buildings, erosion and shore protection issues, infrastructure inundation and increased operating costs when infiltration into the plant is higher, thus raising the demand for water (IUGLS, 2012 as cited in Great Lakes, 2018a).

The review following 2017 assessed municipal water infrastructure impacts with reference to two municipal and industrial water user indicators developed during the International Lake Ontario – St. Lawrence River Study from 2000 to 2005. There were two performance indicators used for that study to record impacts to municipal and industrial water users. The first performance indicator was infrastructure, which includes costs associated with drinking water production plant infrastructure. The second performance indicator was taste and odor, which includes costs of upgrading municipal drinking water treatment plants. Overall, the 2017 assessment suggested that the majority of municipal systems remained operational and did not experience significant damages from the extreme water conditions. Further detail is provided in Annex 1.

2. Review of Annex 1: Supplementary Impact Assessment

Annex 1 of the 2017 GLAM Assessment (Great Lakes, 2018b) analyzes impacts of specific geographic regions along the New York, Ontario, and Quebec shorelines. USACE conducted a review of oblique imagery for the American side of the Lake Ontario shoreline to assess observations of the impacts to properties. Counties were grouped together by geographic location to assess the damages.

Based on the review of the oblique imagery, the counties of Niagara and Orleans contain approximately 4,292 properties within 1000 feet. Of those, 983 properties showed evidence of direct impacts in the oblique imagery. The oblique imagery indicated that 38% of impacts were categorized as due to flooding, 60% from erosion, and 5% from adaptation. Additionally, 75% of impacted properties identified through the oblique imagery and located in the open lake experienced erosion, while 95% located in protected bays experienced flooding. Impacted properties in wetlands, rivers and inland were 100% from flooding based on the oblique imagery analysis. Of 4,292 total property impacts identified through the oblique imagery assessment, 101 were observed to be taking protective measures by the time the images were taken, which included 76 using sandbags, 22 excavating and three building temporary shorewall barriers.

Monroe, Wayne and Cayuga Counties contain 12,140 properties within 1000 feet of the Lake Ontario shoreline, of which, 2,471 were identified as impacted through the oblique imagery. Of the impacts identified from the imagery, 92% were due to flooding, 9% from erosion. 14 impacted by flooding and erosion. Of the 2,471 total impacts identified, 342 properties were observed to be taking protective measures, which included 312 using sandbags, 17 building temporary shorewall barriers, 12 excavating and one pumping.

Oswego and Jefferson Counties contain approximately 18,911 properties within 1000 feet of the Lake Ontario shoreline, of which, 1,727 were identified as impacted through the oblique imagery. Of the impacts identified from the imagery, 90% were due to flooding, 9% from erosion, 2% were cases of adaption. Additionally, 14 received both flooding and erosion. Of the 1,727 parcels impacted in the oblique imagery, 160 were observed to be taking protective measures. All 160 parcels used sandbags, while 10 excavated and four built temporary shorewall barriers.

The USACE Buffalo District conducted an assessment of water and wastewater treatment plants on behalf of the GLAM Committee by directly contacting the facilities. In general, water treatment plants that responded had minimal to no impacts during the 2017 high water events with some even benefiting more from high water. In contrast, wastewater treatment plants are more prone to impacts during high water events. Information was collected from 13 of 24 shoreline wastewater treatment plants, of which, six experienced some degree of impacts during the 2017 high water events.

3. LURA Reports of High Water Impacts Research on Lake Ontario and St. Lawrence River to Municipal and Industrial Water Users

After the initial assessment in 2017 was conducted, the GLAM Committee contracted LURA Consulting to conduct an additional study regarding high water impacts in 2017 for municipal and industrial water users. This study was able to provide more detailed information on the sector. The survey was conducted early in 2019, prior to the high water conditions of 2019, and the responses only reflect impacts from the 2017 high water event although similar impacts would be expected in 2019.

3.1. Sample Audience

The study identified a total of 207 water users in the study area, “which consisted of Lake Ontario (127), Upper St. Lawrence (35) and Lower St. Lawrence (47).” The proposed target sample size from the survey was a total of 43 water users, with 23 on Lake Ontario, 11 on the Upper St. Lawrence and nine on the Lower St. Lawrence. The survey actually received a sample size of 73 water users, with 40 on Lake Ontario, 10 on the Upper St. Lawrence and 23 on the Lower St. Lawrence.

3.2. Impacts of High Water Levels

The results from the survey indicated that 56.2 percent of facilities reported no impact to their facility’s operations (Figure A-1). Different impacts that facilities did experience include flooding of sewer manholes, shoreline erosion affecting pipes near shore, flooding of parking lots, flooding of pump stations, flooding of buildings, spray from waves entering clearwells, pump damage and damage or loss of pipes (Figure A-2).

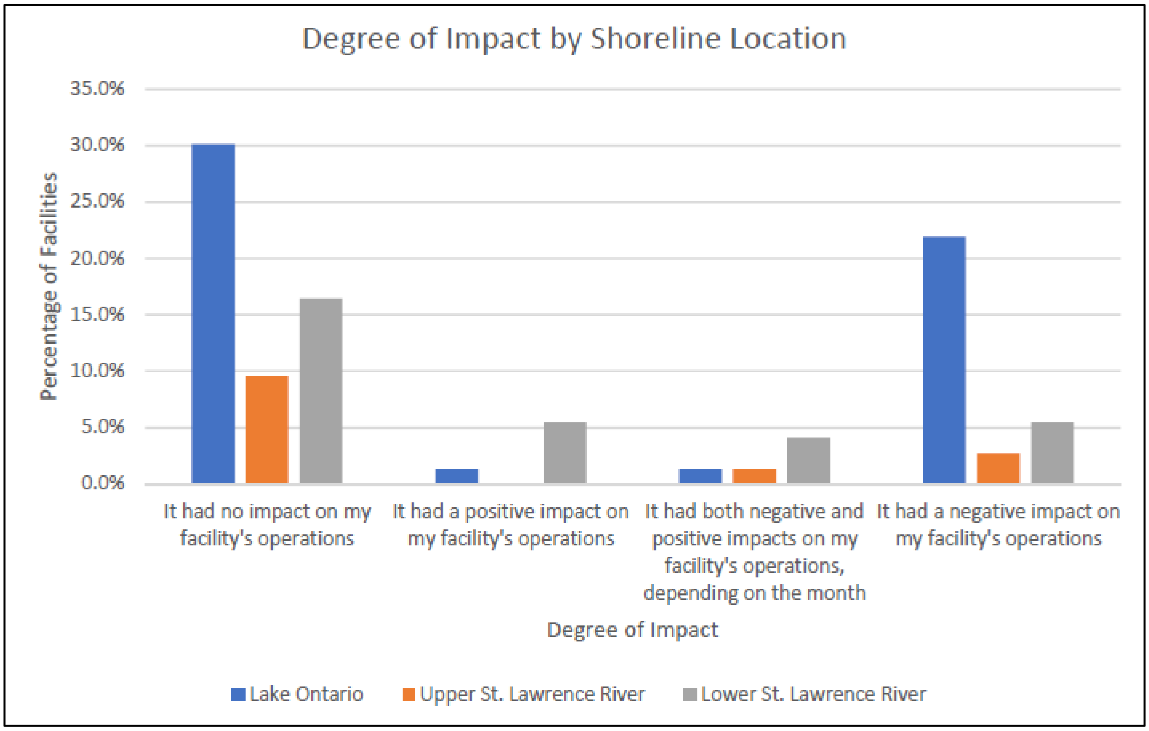

Figure A-1: Degree of Impact on Facilities by Shoreline Location (n=73) as Reported in LURA (2019)

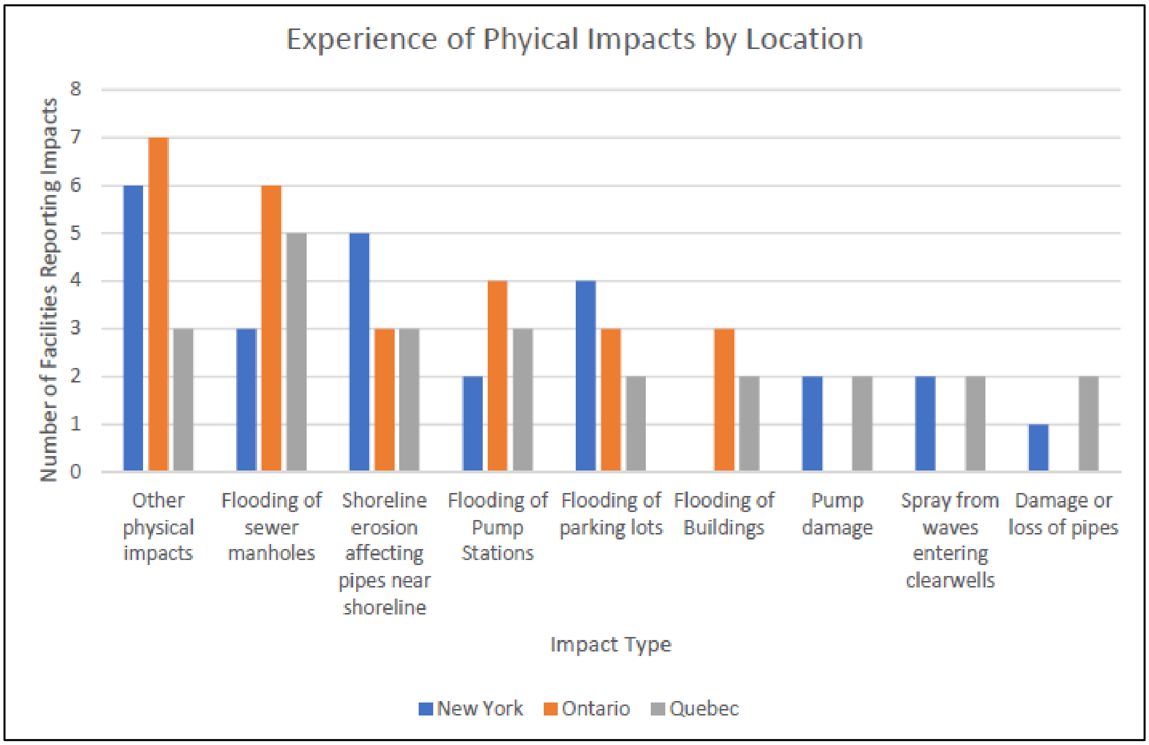

Figure A-2: Experience of Physical Impacts by Location (n=73) as Reported in LURA (2019)

While a majority of facilities did not see a loss of service, seven facilities along Lake Ontario and the Upper St. Lawrence did experience a loss of service, which consisted of four municipal wastewater treatment plants and two municipal water treatment plants on Lake Ontario and one power facility on the Upper St. Lawrence. Additionally, five facilities along Lake Ontario and the Upper St. Lawrence experienced improvements, which consisted of one municipal wastewater treatment plant and three municipal water treatment plants on Lake Ontario and one power facility on the Upper St. Lawrence. Nine facilities experienced water quality concerns, consisting of one industrial facility, five municipal wastewater treatment plants and two municipal water treatment plants on Lake Ontario and one municipal wastewater treatment plant on the Upper St. Lawrence.

3.3. Critical Water Levels

For Lake Ontario and based on the elevations reported by the survey respondents, the average threshold above which there is some concern of impacts on the facility or operations was 251.38 feet, with results ranging 246.72-268.44 feet. The average threshold above which there is substantial concern of impacts on the facility or operations was 252.69, with results ranging 247.99-268.44 feet. The average threshold above which the facility can no longer operate was 257.41, with results ranging 248.36-293.44 feet. It is worth noting that the responses received from this study were highly variable since the respondents did not use the same reference elevation. As a result, the data had to be interpreted, and some data was not used.

3.4. Adaptive Actions

About 33 percent of facilities reported taking adaptive actions during the 2017 events, while 27 percent reported taking actions after 2017. The average cost of actions during the 2017 events were just over $71,000 and the average cost of actions after 2017 was $624,000. Nearly half (47.8%) of all facilities on Lake Ontario and the St. Lawrence River rated the overall scale of impact as a one (low), and three-quarters of facilities (75.4%) rated the overall impact a one,two or three out of ten Overall, it appears that municipal and industrial facilities along Lake Ontario and the St. Lawrence River experienced minimal to no impacts from the high water levels during 2017.

Appendix B: Municipal Meeting Summaries

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IJC / ILOSLRB / GLAM / USACE 26 February 2020
Task #2 Engaging South Shore Lake Communities
11 February 2020 Meeting with Monroe County Municipalities
Meeting Summary

Participants

- Bill Reilick (Supervisor, Town of Greece and ILOSLRB member)
- Bryce Carmichael (U.S. Secretary, ILOSLRB)
- Lauren Schifferle (U.S. Alternate Regulation Representative)
- Bryan Hinterberger, Jay Walter, Erin Cuddihy (Buffalo District, USACE meeting facilitators and support)
- Municipal stakeholder representatives (see attached sign-in sheet). All invited municipalities and the County participated.

Location Town Hall, Town of Greece, New York

Welcome and Introductions

Bryan convened the meeting and thanked the Town of Greece for hosting. ILOSLRB Member Bill Reilich and U.S. Secretary Bryce Carmichael made opening comments and welcomed guests**.**

Bill explained that his community has improved at handling the water levels through early preparation. Greece currently has crews laying pipes to reduce impacts on roads in the future.

Bill Reilich reiterated the following point at various times during the meeting:

1. Regulated outflows have been at an unprecedented high, despite adoption of Plan 2014.
2. Estimates of future Lake Ontario water levels should be forecasted based on trends (e.g., precipitation, supply) observed over the last three or four years (as opposed to all preceding years of data).
3. Shoreline communities should expect and continue to prepare for more high water events in the future.

Bryan reviewed the agenda items with the participants. Bill emphasized that it is important for municipalities and private residences to provide the information and respond to surveys so that their voices will be heard by ILOSLRB.

Some discussion ensued.

- Loss of property is far more significant than costs for protection. Some residences lost 30-40 feet of property. How has this loss been assessed? Does GLAM intend to quantify properties by parcel to parcel data and use damage curves to assess damage? Is GLAM sending people into impacted properties to truly assess damages? What about using LIDAR or GIS?
- Wind-driven wave events cause damages beyond the extent of high water-level. How are wave-related impacts assessed as compared to water level impacts?
- Did GLAM contact the state about the information on the survey? Bryan and Bryce explained that the intention was to communicate, request and share information with the State as soon as possible. There is recognition that much of the requested data has been collected through REDI. There is currently a communication challenge/gap due to a lawsuit over Plan 2014.

IJC / ILOSLRB / GLAM / USACE 26 February 2020
Task #2 Engaging South Shore Lake Communities
11 February 2020 Meeting with Monroe County Municipalities
Meeting Summary

Presentation

The joint presentation by Bryce Carmichael and Lauren Schifferle, and subsequent discussion, dominated the meeting agenda. Meeting participants welcomed and appreciated the presentation and opportunity to ask questions. Although 45 minutes had been set aside in the agenda for the presentation and discussion, 1 hour and 25 minutes were dedicated to this agenda item. Bryce and Lauren engaged in a respectful, technical explanation and debate with Bill and technical representatives of the communities regarding projections of future water levels. Bill and several other municipal representatives seemed most concerned about the validity of lake level estimates, with a special interest in public risk communication, emergency preparedness and budgeting. They expressed dissatisfaction with the uncertainty of the projections and the variability, and emphasized a need for conservatively-high "worst case scenarios" in order to prepare accordingly. Participants asked "What do we tell the residents?"

A few participants insisted that a projected lake level should be forecasted based on environmental conditions (e.g., precipitation, supply) observed over the last three or four years (as opposed to all preceding years of data). One participant recommended that a sensitivity analysis be performed to consider different historical windows of precipitation-evaporation.

For the sake of remaining time, Bryan proposed that interested stakeholders prepare a formal recommendation and submit the methodology to the GLAM for further consideration. Participants agreed with this approach. Participants expressed interest in a focused follow-up conference call with the GLAM to further explore the idea.

An inference was shared that that high-water alone is not the only threat. A high wind event, during a high water event, is capable of causing significantly more damage.

Questionnaire Survey

The purpose of the survey was very briefly described in order to conserve remaining time. No specific questions were reviewed or discussed. Municipalities were encouraged to respond to the survey. The GLAM is seeking information on impacts and actions that are being taken to reduce future damages. The GLAM is interested in geographic location of impacts as well as the timing.

Municipal Presentations

Note: with little remaining time on the agenda to allow for discussion, technical representatives of each municipality provided succinct descriptions of damages, impacts and resiliency actions that had been undertaken.

Representatives from Town of Irondequoit and City of Rochester had to depart early due to scheduling conflicts and were not present to provide descriptions.

Town of Greece

Storm water goes into ponds and wetlands. When ponds rose, it flooded roads. A pump station failed and had to be updated. At Round Pond, the lake and the pond met for an extended period. Pumps needed to be maintained by two people, 24 hours per day for three months. Sanitary sewers blew manhole covers off and required six NYSDEC permitted bypasses. The cost to updgrade and realign the sewer line was $9 million. The pump station was at 15 ft. (3 ft. were normal) 2,000 homes were impacted. 12 pump locations were identified and repaired with REDI funding. An additional 12 pump locations requiring upgrades were found after REDI funding had been allocated.

A berm overtopped, requiring homes and businesses to be evacuated for months. The berm was improved and will be raised/improved further. The sewer line on Edgemere Drive has to be replaced. There were 24 critical locations in Greece after the 2019 event. Sewer system required upgrades (valves, larger lines, bladders). More shut off valves were needed in the marina to prevent back flow. A seawall washed out. Damages occurred along over 20 miles of shoreline. Greece's main assets are roads, marinas and parks.

Goodwin Park lost half of its useable space in both 2017 and 2019. It has been used as a staging area.

250,000 sandbags were filled and distributed in the town.

During high water, there was a lack of availability of first responders along Lakeshore.

Greece contains over 2,000 parcels in the flood zone and not many people have insurance. Very old homes are in danger, and there is concern of health problems because of flooding. Mold is expected to be a long-term problem and there had been a problem with mosquitos propagating in people's homes.

The EPA-funded Braddock Bay ecosystem restoration project was negatively impacted. Clumps of floating phragmites (most likely cattails) caused an obstruction in the marina. Floating docks installed after 2017 were effective in 2019.

Greece had spent $1.5-$2 million and an additional $12 million in REDI funding. Greece will spend $12 million just in 2020.

Most problems are not compatible with USACE, Continuing Authorities Program (CAP) Section 14 funding because of minimal municipal land along the shoreline aside from pumps. (Note: inference made by Town of Greece stakeholder with knowledge of Program). Most shoreline is made up of residential property and old, narrow, and small lots. Greece appears to have incurred the greatest damages in Monroe County.

Town of Hamlin

Impacts were similar to Greece but on a smaller scale. Flooding over and under roads causes long-term cracking. Storm sewer systems and septic systems were underwater and not functioning. $7.9 million was received through REDI for septic upgrades. Pumps are needed for storm sewers. Houses are dangerously close to the lake. A new drainage system needs to be installed. There was a smell of dead fish throughout the town. High water impacted productivity and revenue, because crews were required to deal with high water impacts and not on revenue-generating activities such as road maintenance. During high water levels, crews are not able to access certain locations and make repairs due to safety considerations.

IJC / ILOSLRB / GLAM / USACE **26 February 2020**

Task #2 Engaging South Shore Lake Communities
11 February 2020 Meeting with Monroe County Municipalities
Meeting Summary

Town of Webster

22 miles of shoreline has been impacted. There is significant erosion along the lake and from Irondequoit Bay. People are losing many feet of their property (10-50ft.) due to water and wind. Erosion problems are severe due to sandy soils. If lake levels go above 249 ft., Lake Road will be under water. Ginaa power plant uses Lake Road as an emergency “escape route”, recognized by FEMA, and loss of access is a major impact. Revenue is lost as a result of having to turn down projects and work while dealing with the water levels and safety issues. Storm sewer systems were underwater.

Residents of the Town blame Plan 2014 and are eager for updates from IJC.

Town of Parma

3.2 miles of shore has been impacted. There had been 35 ft. of land along lake prior to 2017 and there is less than 10 ft. now.

Septic systems have failed, roads have flooded, and there is need to install shut off valves to stop backflow. Six to eight homes have been abandoned since 2017. Roads cannot currently be fixed. Wetlands flooded and flooded out yards and over 200 homes. Streets have needed repairs for over three years, but repairs are not possible under these conditions. Staff were needed to man pumps from flooded sewers, which is very resource intensive. Payne Beach road, which has a sewer line in it, is more vulnerable due to erosion between the beach and road.

Monroe County

Other descriptions are representative of County-wide impacts. High waters caused resource problems and an inability for first responders to get to affected areas. Carp go up pipes, die, and create an awful smell.

Site Visits

Photo: Kirk Morris, Commissioner of DPW for Town of Greece describes the replacement and upgrade of a critical pumping station.

Photo: Town of Greece technical staff describe the impacts at Goodwin Park.

Sign-In Sheet

Name/Position	Email
Kirk Morris, Commissioner of Greece DPW	KMorris@greeceNY.gov
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Bryce Carmichael, LOSLRB Secretary	Bryce.W.Carmichael@usace.army.mil
Jack Barton Town Supervisor	Supervisor@parmany.org
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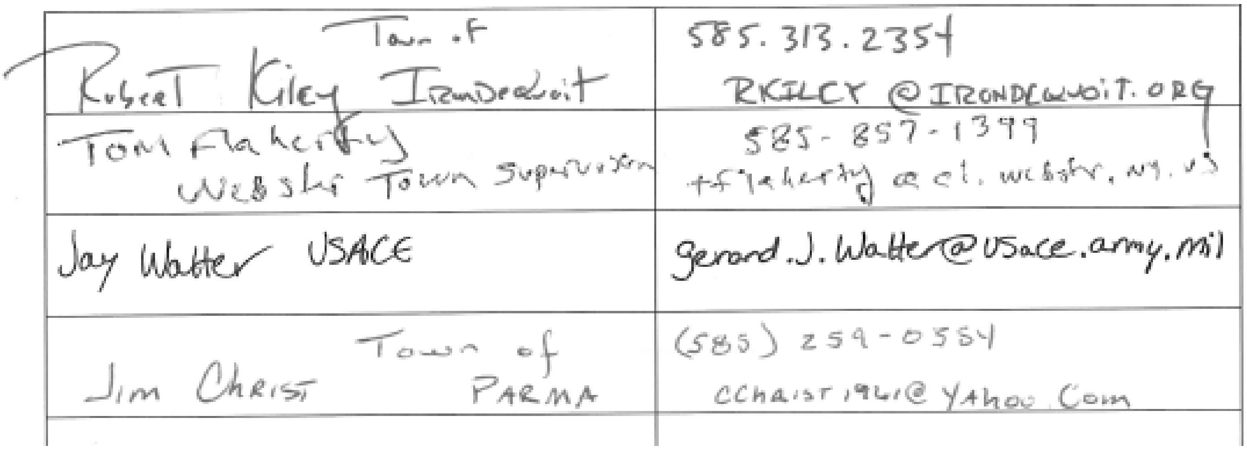

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IJC / ILOSLRB / GLAM / USACE **9 June 2020**

Task #2 Engaging South Shore Lake Communities
9 March 2020 Meeting with Niagara and Orleans County Municipalities Meeting Summary

Participants

- Bryce Carmichael (U.S. Secretary, ILOSLRB)
- Lauren Schifferle (U.S. Alternate Regulation Representative)
- Bryan Hinterberger, Jay Walter, Erin Cuddihy (Buffalo District, USACE meeting facilitators and support)
- Municipal stakeholder representatives (see attached sign-in sheet).

Location Carlton Administrative Offices, Town of Carlton, New York

Welcome and Introductions

Bryan convened the meeting and thanked the Town of Carlton for hosting. U.S. Secretary for the ILOSLRB Bryce Carmichael made opening comments and welcomed guests**.**

Presentation

Bryce Carmichael and Lauren Schifferle provided the presentation. Meeting participants were very engaged during the presentation and subsequent discussion. The presentation included the following points and topics:

- Overview of the GLAM and how the Lake Ontario-St. Lawrence River Board is organized.
- Reference to previously-provided information and links, including reference to the 12-member Lake Ontario-St. Lawrence River Board biographies available online.
- GLAM associates and classifies impacts with six different groups (riparian communities, tourism, water infrastructure, navigation, environment, and power generation).
- Information regarding lake levels over the past 100 years was provided and compared with current conditions. Ottawa River and other Lake Ontario tributaries play a large role in lake levels and regulation. Water coming into Lake Ontario from Lake Erie is significantly higher than past years. High water levels are being recorded throughout the Great Lakes Basin. Lake Ontario outflows were very high in the last year. Water levels are not regulated. Discharge is regulated.
- The Saint Lawrence Seaway Project made it possible for more water to pass through the river, more quickly, than before construction. Recent outflows from Lake Ontario have been changed almost daily to try to remove as much water as possible.

Presentation Q&A

Q (Village of Youngstown): How much does the Upper Great Lakes control (at St. Marys River) impact the supply into Lake Ontario?

A (Bryce): Very little. The time span for water released at St. Marys River to reach Lake Ontario is 3-5 years and the amount is influenced by factors such as evaporation.

Q: Regarding the Niagara River and power authority, Niagara River is decreasing reservoirs and increasing flows into Lake Ontario. If they are not diverting water into the reservoirs what is the effect on the Niagara River and Lake Ontario levels? Can we store more water in the reservoirs, and will this make a difference in lake levels?

A: Any water that does not go into the reservoirs goes over the falls, and the reservoirs do not have much capacity, so it has little impact to the supply into Lake Ontario. The reservoirs do not have as much effect on the levels and the shorelines of the Niagara River. Lake Erie is high and this is the main reason Niagara River flow is so high.

Q (Town of Carlton): Any storm has a big effect. The shoreline is already compromised and there is no natural protection anymore. There has to be some solution to lower the lake levels. We need another path for the water to get off of the lake. Lake St. Lawrence is too narrow and unstable. We need more resiliency measures for protection of the shoreline. Maybe widen the St. Lawrence more? What else can be done to divert water in the upper great lakes?

A (Bryce): Any alternatives to influence water levels through a diversion would be highly infeasible and/or cost trillions of dollars. Bryan explained need for authorization and appropriation from Congress before the Federal governmental may undertake a study of this magnitude.

Q (Town of Yates): Is there evidence that applying the 1958 plan (prior to Plan 2014) would have changed the outcomes of the 2017 and 2019 high water events? Do you have a comparative analysis?

A: An analysis was done to compare Plan 2014 and Plan 1958 and shows that the difference in water levels would have been ~3cm. Deviations from the plan have also further reduced levels.

Comment (Orleans County): There is too much water and you do not have the means to remove it from the lake. I do not like how the Plan 2014 was introduced. We should meet about the 1909 treaty because there is not enough flexibility in how decisions are made. Every community is different and we need more money for shoreline management, but that is not a static issue. We need to tackle root causes and adjust the treaty. However, the focus should be less on changing Plan 2014, and more on resiliency. We (Orleans County) currently do not have enough funding to increase resiliency ($20 million in 2019).

Questionnaire Survey

The survey was alluded to during the presentation. Jay Walter more thoroughly described the purpose and content of the survey as a separate agenda item. Municipalities were encouraged to respond to the survey in order to communicate their knowledge and perceptions concerning high water impacts. There was general acknowledgement of receipt of the survey and some had already completed it. One participant indicated that he had not received it and Bryan agreed to send.

In addition to information on impacts, the GLAM is seeking information concerning actions that are being taken to reduce future damages. The GLAM is interested in geographic location of impacts as well as the timing. Assessing dates will inform the degree to which impacts are due to high water conditions or weather events.

The intent is to request and hopefully receive data from New York State, in addition to information from the municipal communities. Information sharing is currently limited due to a lawsuit.

Q: Is this a duplication of other surveys intended for private property owners and impacted residents? Are you asking us (municipal representatives) to collect data from landowners?

A: The referenced questionnaires are separate and the data is being assessed separately. This questionnaire is intended to collect information about municipality impacts.

Municipal Presentations

Representative(s) from each municipality and County provided their perspectives on the impacts of high water levels.

Orleans County: Tourism has been impacted. Marinas and docks were underwater. Roads were flooded. REDI helped to rebuild county roads, parks and marinas but it will never replenish and undo all the devastation to tourism and marinas. There were 548 capstone applications in 2017 ($16.2 million for resiliency). Homes on the shore were damaged, and some are yearlong homes that have been there for a long time. These houses lost all of their lake frontage and break walls were lost. At 249' and 250' infrastructure began to be compromised (due in part to wind and weather events). In 2019 infrastructure was compromised at 249'. Trigger levels are at 247'. Debris in water causes unsafe boating. $289 million (11% of tax base) of property is along 4 miles of shoreline. There has been so much debris to clean up. The County is in a planning stage to improve readiness and resiliency.

There is an interest in changing the narrative concerning impacts to private properties; they represent a major fraction of the tax base. Damage to private properties impacts the entire community

Niagara County: The impacts are similar to those reported for Orleans County. Businesses may not reopen and communities in the county will not recover. Marinas are the biggest tax generators and they are getting silted in, making it difficult for boaters. The tourism numbers, fishing conditions, and boating numbers are all impacted. The Coast Guard station in Niagara had to move out of their station. Wilson waste water treatment plant had problems. There were 148 days pf pumping last year, costing $22,000 in diesel fuel. Without pumping, 85 homes would have been evacuated. Many preventative measures were taken to keep businesses running (e.g., pumping and sandbagging). Preparedness is a major theme, including moving assets into place. Volunteers were responsible for moving many sandbags. Resources were pulled from normal road repairs, impacting the roads. Mental health and well-being of emergency service responders should be considered. Some indicated that they would not return to those positions in future years.

Town of Carlton: Erosion and tourism were really affected. County/Town are required to pay 5% of REDI projects and they have a hard time justifying it to tax payers that are not affected. A lot of funding has been earmarked for property repairs. Break walls cannot be repaired because there is still high water, requiring contract adjustments. There has been three years of constant damage.

Task #2 Engaging South Shore Lake Communities
9 March 2020 Meeting with Niagara and Orleans County Municipalities Meeting Summary

Town of Kendall: There was $1.9 million in damages in 2019, excluding culverts. There was damage to drainage ways and culverts. There was $180,000 in residential impacts. Septic tanks, marina, and ramps all need repairs. Private drives are not made for the heavy vehicles that have been accessing the shoreline and the individuals pay for damage out of pocket because no public funding is set aside for this. $16 million was received through Pathstone. Eagle marina was decimated in 2017. DEC provided a permit quickly to protect the marina from flooding, without which businesses would have gone under. Ice caused destruction of protective structures. Beach and public areas were unusable. Sandbagging cost $213,000 and required a lot of volunteers and additional donations. Volunteer time and donated funding are not accounted for. Residential resiliency funding was not approved. Lessons learned from 2017 include: aquadams are not effective and farmers grain bags can hold the amount of 40-50 sandbags and were highly effective. Use of a “bag rake skeet” (which costs $6,000) requires 3 people to operate instead of 15 for sandbagging, and decreases labor costs.

Town of Yates: There are few businesses and so private properties have taken most of the damage. People have been spending money without getting reimbursed. The County would have better estimates of damage to private property. The town owns two ends of roads and a park and received CDG grants in 2017. What baseline water level should we be protecting ourselves to? Village of Lyndonville could use funding for waste water plant, as silt could impact water intakes. The issue is not high water, but low water.

Town of Newfane: not present

Town of Somerset: Most impacts are from erosion. The historic lighthouse at Golden Hill State Park is at risk. Boating was impacted.

Village of Youngstown: 80% of lake frontage is residential. The village is investing a lot of resiliency funding on the water front. Losing Water Street would be like losing the Village. The tipping point for village is 249’. They did not have to mobilize people, but if water gets higher they might have to evacuate houses. They had to sandbag areas. The potential need to build a wall would change the tourism and viewshed. Niagara Jet Adventure is a major economic driver and was stressed. Niagara Jet Adventure offers the only fuel dock on the lower Niagara River, which is also used by the Coast Guard, Border Patrol, Sheriff’s Department and the State. They had to close boat launches. A lot of debris came through.

Porter: Most impacts were to homes on the lake. Docks were lost and there was erosion along shoreline. Parks could lose land if levels get to 250’. It feels like the Niagara River is being forgotten, there is no funding from the State for river property. There were major impacts at Four Mile Creek State Park and Old Fort Niagara. There is no riprap in Four mile Creek. The RV park at Six Mile Creek was impacted and sandbagging was required.

Town of Wilson: Tuscarora Park has lost their beaches and is losing boat slips. 500 boat slips along west side of harbor will be closed. At 246’ the waste water treatment plant would start to feel the impact. The treatment plant only can handle up to 251’ without failure. REDI money funded to shut down plant. Wilson boathouse lost $450,000 and is the largest taxpayer. The harbor is the largest employer.

Village of Wilson: Business owners are losing money and business and residents are feeling the impacts of high water. The harbor is largest employer and it is having problems. There is a decrease to quality of life. Downtown businesses are impacted from decrease to tourism.

Follow-up Discussion

The agenda was accomplished ahead of schedule. Some participants began to depart and others remained for open discussion.

Suggested by the Niagara County Emergency Management officer: Lewiston should be engaged to inquire about their impacts.

Suggested by Town of Kendall: we should talk about how we changed/ made improvements from 2017 to 2019 to try to combat damages from high water levels. Example: use of grain bags instead of sandbags.

Suggested by Town of Kendall: I want to see USACE study options to mitigate damages and wave action and protect our shore. Should we build spillage areas? Alternatives should include creation of a canal to connect waterways together to get water off of the lake. Study should consider what can be done in the long term and into the future.

General observation: there seemed to be broad interest and desire in expanded State and Federal projects and aid to improve shoreline resilience.

Photo: Discussion and Q&A with Niagara and Orleans County and Municipal representatives.

Sign-in Sheet

Name/Position	Email
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Dana Woolston	town of Carlton Dep Super
JIM SIMON	TOWN OF YATES SUPR

Bryce Carmichael	Bryce.W.Carmichael@usace.army.mil
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Karen Narburgh	TownCarl2@yahoo.com
Jon Dewart	Town of Somerset
Arthur LAWSON -Did Not recieved survey	MAYOR@villageofwilson.org Village of Wilson
Resolutelw@aol.com LARRY WHITE	TOWN OF PORTER
Christopher M. Bourke Sheriff	Sheriff@ORLEANSCOUNTYNY.GOV

IJC / ILOSLRB / GLAM / USACE 25 August 2020
Task #2 Engaging South Shore Lake Communities
17 August 2020 Virtual Meeting Summary
Oswego County Municipalities

Participants

- Bryce Carmichael (U.S. Secretary, ILOSLRB)
- Lauren Schifferle (U.S. Alternate Regulation Representative)
- Melissa Kropfreiter (GLAM)
- Mary Austerman (New York Sea Grant and GLAM)
- Bryan Hinterberger, Jay Walter, Erin Cuddihy (Buffalo District, USACE meeting facilitators and support)
- Municipal stakeholder representatives
    - Jeffrey Hinderliter (City Engineer for City of Oswego)
    - Terry Bennett (Oswego County Emergency Management Office)
    - Dave Turner (Oswego County Planning)
    - Renee Fox (Oswego County Emergency Management)
    - Cathee Palmistesso (Oswego County Director of Emergency Management)
    - Randy Griffin (Fire Chief, Director of Emergency Management for City of Oswego)
    - Rick Kaulfuss (Supervisor for Town of Oswego)
    - Bill Scriber (Executive Director for Port of Oswego)

Location Virtual (Webex) meeting

Welcome and Introductions

Bryan convened the meeting and extended thanks to participants for time, patience, and willingness to adapt to the virtual meeting format. Bryan briefly described the purpose for the meeting, emphasizing the desire for an exchange of information and improved communication channels. Bryan also communicated the desire to create an atmosphere of a roundtable discussion, despite the virtual format.

U.S. Secretary for the ILOSLRB Bryce Carmichael and U.S Alternate Regulation Representative Lauren Schifferle made opening comments and welcomed participants**.** Participants introduced themselves. Bryan reviewed the agenda and the meeting proceeded.

Presentation

Bryce Carmichael and Lauren Schifferle provided the presentation.

Q&A

Renee Fox inquired if there had been reach back to the State Office of Emergency Management, who should have the results of the Flood Mitigation assessments on properties.

Bryan replied that communication with the State has been constrained due to litigation related to Plan 2014, but that the intent was to reach out to State offices as soon as communications are restored.

Bryce explained that in 2017 there had been outreach to NYS Department of Homeland Security and the Local/ Regional FEMA office, but no response came from agencies at that time. Outreach to State offices has been attempted in the past. One recommendation from the Government Accountability Office was to establish Memoranda of Understanding with these agencies to improve communications.

Renee Fox inquired if there is an email address to send information to. Bryan offered to receive and disseminate all email correspondence in the interim. Bryce suggested that the ILOSLRB section mailbox (for which there is a link on the webpage with a contact form) would be the appropriate long-term address for correspondence intended for the ILOSLRB Secretaries. There may not be a feature to include attachments. Bryce agreed to send the address to Bryan, who will send to participants.

US Section Secretary
International Lake Ontario -St. Lawrence River Board
ILOSLRB-USSection@usace.army.mil

Question from Randy: With water levels going down and with less precipitation, why aren't the high levels on the upper lakes being addressed?

Response from Lauren: The only Great Lakes influenced by regulation are Lake Superior and Lake Ontario. Others are uncontrolled, at the whim of natural conditions. No body [of decision-makers] has control over those lake levels. Years 2018 and 2019 started in the same condition, but the conditions changed due to precipitation. Just because the upper lakes are high does not necessarily mean Lake Ontario will be high. 80 per cent of Lake Ontario water comes from the Niagara River and is uncontrolled. The driving factor of Lake Ontario Water levels is precipitation any given year.

Because of regulation, the board has the ability to make water leave Lake Ontario more quickly than under natural conditions, which helps to reduce levels on Lake Ontario.

Response from Bryce: There is a balancing principle built into Lake Superior Plan 2012 to keep levels of Lakes Michigan, Superior and Huron in step with each other. It is difficult to make any meaningful difference on Lake Superior levels. Lake Superior is high and increasing but not at the high from last year. Huron and Michigan are at all-time highs for the month of August. Forecasts of Lake Ontario levels are really focused on Lake Erie, as it takes such a long period of time for water to move from the upper lakes. Those levels are good to be aware of, but so many factors can change the inflow to Lake Ontario.

Question from Dave Turner: Randy’s question was a good one because we have witnessed what happens when we do not act proactively and wait for the impact to occur to address problems. What are you doing now to prepare for the long-term impact? You verified it takes a long time for water to move into Lake Ontario, but I’m not sure I heard an answer to what you’re doing to address the levels proactively.

Bryce responded: There is uncertainty in the forecast. We know there is a lot of water is in the system, but things could change. Previous, similar cycles have been ended by drought. Being overly proactive could also cause negative impacts.

It’s difficult to base regulatory decisions based on potential risks. The board did look at a repeat of conditions from 2019 in 2020 and did manage to take productive action and facilitated deviations. However, low ice conditions allowed for those deviations to be successful. It is very hard to look far into the future and take action.

Lauren: We do not know the future years' precipitation and water levels, and we do not know the impact of climate change. We do know over the next 100 years there will be dry years and low water years.

Dave: At risk of saying what you've heard from many, the lake operated well under old [Regulation] plan and it is highly coincidental that within the first three years of the new plan we have had these situations. Going back to the old plan may help control levels, because the plan controlled levels well for over 50 years.

Lauren: We did look in detail at what would have been done differently under the old plan. It came down to poor timing of high water levels and high precipitation at the same time. High levels would have happened under the old plan; Spring precipitation is most impactful because it coincides with snow melt. The wettest and second wettest months occurred back to back, and no one could have predicted those conditions.

Bryce: During development of Plan 2014, they spent many years reviewing board decision during high water events. Actions taken informed more codified rules in Plan 2014 and provided the board more deviation authority. Recent decisions made were very similar to decisions made during similar events of the past. We recognize it is easy to draw the correlation between the recent high waters and the enactment of Plan 2014, but no more Regulatory action could have been taken. Part of what the GLAM is doing is looking at board decisions to see if there is any room to improve regulation.

Question from Jeff: How do we mitigate the bad timing in the future? What is being done for the future?

Bryan observed that what was meant by "bad timing" is the implementation of Plan 2014 at the same time as historically high precipitation and lake levels, unrelated to the Plan, and the perception of the two being related.

Question from Jeff: If meteorologist can look at El Nino and La Nina, and predict hurricanes, I would think you would be able to better predict conditions based on meta data, so that we do have some ability to react. What action is GLAM undertaking to use data going forward, and not retrospectively?

Bryce response: through GLAM there is a hydroclimate team, which considers data and input from U.S. and Canadian agencies to improve accuracy of forecasting, including impacts from shifting storm systems. This work is in progress and any helpful information will be communicated to the board. The board is still focused on risk.

Overall the forecast has been pretty successful based on past weather patterns.

Forecasting is not going unaddressed by the board, but advance actions must be taken with thought to what advance changes would do to other interests. There are many factors involved in looking into long-term forecasting. Nothing groundbreaking is in the short-term horizon.

Question from Mary: I'm new to the GLAM. In my position as Coastal Communities Development Specialist for New York Sea Grant I have been working with many municipalities. In your plea for more information, it would be helpful to identify the information gaps. We know the municipalities are being asked for information from a number of groups. What exactly is needed?

Response from Lauren: You can send anything you sent to the State and FEMA. What the board is looking for is what these water levels mean in terms of critical infrastructure. Part of the work is to validate model, so any information on the number of buildings flooded is helpful. There is a shoreline survey intended for residents. Please use your platforms to encourage residents to go fill out the survey.

Bryan also responded: It would be most helpful to start with the survey questionnaire that I had sent out, associated with this particular meeting. It contains a finite list of questions. Please start with the questionnaire survey and I will accept and pass along any other information that you would like to send.

Bryan also explained that one very important piece of information is that critical elevation at which municipalities start seeing impacts. Also, on what dates were those elevations reached and how was infrastructure impacted?

Bryce responded: I was going to say the same. The survey is intended to inform and validate the model. The intent is not to create repetition or burden. The questions in the questionnaire will really inform future decisions.

Randy commented: Oswego County is mostly impacted by wind and wave action and surges. The issue is not just pure flooding from lake levels. I am concerned that both models correlate levels with flooding. Here it is more dependent on wind direction.

247’ is the critical elevation.

Do models take into account wind and waves?

Also, the condition of the breakwall is a factor. If repairs are made that may help and play a factor in the model.

Comment from Bill Scriber comment: USACE keeps putting repair of the breakwall as critical need and it [the budget request] is removed by D.C. (sic). If the breakwall is brought up to standard, there will be less damage.

Comment from Dave: Those are good points about surges.

Breakwalls only protect properties in or around the City of Oswego. Elevations mean different things to different counties and communities. 247’,248’, 250’ means different things to different communities.

Going back to 2006 in communications with Federal entities, we have always talked about the location of Oswego and the effects of prevailing winds, but have not been heard. That includes during adoption of Plan 2014, which didn’t account for wave action and surges. We’re at the long end of the fetch. Many people said this in public meetings before Plan 2014 was adopted. We’ve never heard anyone say we understand or offer to help with that.

We appreciate your time and this exercise. 2017 and 2019 damages show that that the impacts are different across the counties.

Comment from Renee Fox: I agree concerning our location on the east side of lake as it relates to the wind and wave damage. As an example, flood mitigation assessments have occurred just days after storm, after the water had receded and conditions were had changed.

The Emergency Management office was the clearing house for information during past storm events and has a lot of information. It would be helpful to know what you want specifically. We have many emails and pictures of recession, for example.

New York's Flood Mitigation Assessment Reporting System would be a valuable tool for you and includes site-specific information. Other municipalities would have also have more specific info. The Emergency Management office has higher level information, not economic impacts.

2019 was much more significant than 2017; damage was more extensive in terms of reported damage to barrier walls and erosion.

Bryce responded: It is helpful to know about the Flood Mitigation Reporting System.

We are very keen on building wind and wave impacts into future modeling efforts and how current structures correlate to vulnerability. Also, we'd like to know which structures deteriorated in 2017 and 2019, and how much worse were the impacts due to deteriorated structures.

It is very clear that storm events cause impacts and they are being accounted for. It is hard to do that without data. If you provide dates, we can look at buoys and data from NOAA and USGS. We do understand that Oswego is different. Those factors are being looked at by GLAM. Dates are very important.

I'm sorry to hear that you feel this input has not been heard.

Comment from Renee Fox: June 14, 2019 was a significant storm event.

A lot of rip rap was put in after 2017. The strength of the water tossed stones onto lawns, and waves were reaching behind riprap. On several properties the new rip rap was disturbed and removed. Some properties were abandoned after 2017, which impacted the neighboring structures.

Another issue was the swamp. There was no ability to drain areas between the lake and the swamp. Roads were flooded.

Bryan thanked participants for the productive dialogue and guided the conversation to the next agenda item, to discuss the survey.

Questionnaire Survey

Jay provided a brief explanation and overview of the survey of municipal impacts. Jay commented that we were having a good conversation and it all related to the survey. The survey is focused on municipal infrastructure. There are a few questions about damage to properties, but that is not the main focus.

Thresholds, dates and locations are important, as is information concerning differing causes of impacts such as wave impacts.

We want to know about temporary and permanent measures taken, such as REDI-funded projects. There is a question about impacts to recreation and tourism, which can include any impacts to boating.

There is a separate ongoing task related to recreation and tourism.

Survey Discussion and Q&A

Question from Renee: Was there a different survey sent to property owners?

Response from Bryce. There were two questionnaires sent to property owners in 2017 and 2019; but responses are were spotty. Some good information was received, but was not conclusive or comprehensive. Some people were hesitant to share location information due to privacy concerns. It was a helpful effort but incomplete.

Question from Dave for Jay: Are you only interested in municipal damage?

Response from Jay: We'll accept other information, but we are looking primarily for information on municipal impacts.

Comment from Dave: You can use the REDI process as a source. In 12 private marinas in Oswego County, the estimated cost to protect and repair was $14.5 million.

Response from Jay: that is good to know and does relate to a separate data collection task concerning recreation and tourism.

Comment from Bryan: That is a large figure. Send all information to us, and we'll sort out which categories the various impacts fall under.

Comment from Bryce: Boating data is key and GLAM is definitely interested.

Comment from Dave: Damages caused by flooded wetlands and marshes was not considered damage from Lake. Data related to private and town roads was not collected because people were told that those damages were not eligible for funding because it was not direct lake flooding.

The Plan was for marshes to act more naturally. In 2017 and 2019 they flooded over; septic systems flooded because the water table was so high. Damages were not covered by any funding mechanism. There are numbers out there from the damages that occurred across 22 roads in Owego County, including one in the City of Oswego. All these roads sustained damages from adjacent marshes.

Bryan offered for Dave to begin his presentation, as segue into the next agenda item.

Municipal Presentations

Note: See slides attached to the end of this summary.

Oswego County

Participants viewed slides provided by Dave on behalf of Oswego County, as Dave presented. Dave credited the Emergency Management Office with preparation of some of the content.

The volume of reports has increased in recent years. Damage is from ongoing wind and wave action. Many people have family-owned seasonal homes and camps, which serve as a family legacy going back for generations.

What gets missed is there is a lot of money that comes from seasonal property owners, who spend the summer here. Because they are not permanent residents (although they are taxpayers), people do not collect data from them. It is discouraging that some people are walking away from their properties.

Renee provided an example: An elderly woman who lives in Ohio and gets dropped off by her family to live Oswego for the entire summer, says she has never seen anything like the damages in her life.

Another comments from Renee: After 2017 damages, Oswego County received disaster assistance for a youth camp. Those are the types of impacts that relate to your survey (see slide).

Dave continued: Rip rap was tossed around; including ATV-size stones.

Regarding mitigation measures, we have a good report provided by New York State.

Dave summarized the data: almost 5,000 empty sandbags were provided, 492 feedbag were provided; 26 2-inch pumps, 27 3-inch pumps, 6 4-inch pumps; 350 feet of jersey barriers, 141,000 filled sandbags were requested and received. Most of those were tossed into lake through wave action and wash up daily. 700 feet of water bladder, 65 filled feed bags were provided.

There were 13 different municipal projects under REDI along the lakeshore, totaling $25 million for municipal property alone. There was an additional $14 million provided for marinas, not counting private properties.

Renee co-presented: New York State Office of Emergency Management completed 168 flood mitigation assessments. When the process started, assessments only occurred when there was a threat to safety and were not comprehensive. More assessments occurred further into the process.

In 2019 a Federal Declaration was not made and damage assessments were not collected from property owners. There were effects to structures and safety is a major consideration, so there are larger, unreported numbers.

Dave provided an example: Campgrounds have been flooded, such as Brennan's Beach. On a typical summer day, it would be third largest city in the county. Sites have been inaccessible, but those damages are not considered in any assessment. If there was a Federal disaster declaration, there would have been disaster representatives to work with local representatives on estimates. I'm not sure where to find that information now, considering private properties were impacted.

We could probably share info from the State Emergency Management Office, while you can't get that information directly from the State.

Question from Renee: What is the timeline for the request and receipt of information? It is a sticky time because of COVID and school starting.

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Oswego County Municipalities

Bryan: we'd like the survey responses in the next 2-3 weeks because we owe summary report soon. Sooner would be better. Beyond that, there is no time limit on sharing information.

Port of Oswego:

Bill Scriber presented slides on behalf of Port of Oswego. Bill has a damage assessment and can send.

Port of Oswego is the only commercial port on Lake Ontario in New York and its financial stability is connected to the water. The Port's economic benefits are recorded in a report by the St. Lawrence Seaway as follows: the port generates $26.7 million into economy; 209 maritime jobs. It consists of not just the Port, but one marina and second marina under construction.

In 2017, $6.2 million in damage occurred to piers, docks and retaining walls. One road built in 2014 along Lake Ontario expansion site incurred $2.4 million in FEMA project damages.

The Halloween storm caused substantial damage to the main dock. Wave and water action are unique in Oswego.

Oswego marina has not only raised docks with REDI funding. We now have replaced docks with floating docks in the east marina. $67,000 of Port funds were spent to reengineer docks and another $40,000 was received from REDI. The docks should now be able to operate under high and low water.

The west pier directly faces the most damaged portion of the breakwall. In 2017 high waves breached the wall and undercut dock, and the structure failed.

The east dock contains 24 drains that collect water and run into the lake. Water breached drains. They had to plug and pump them out with 6-inch pumps. Since the drains are built into docks, it will cost millions to replace for the future.

East dock damages resulted in Federal disaster declarations in 2017 and 2019. Parts of the dock eroded away. Water breached the granite stone used as the first barrier.

12 to 14 ton blocks are moved into the lake. One repair went to bid for $500k for a section. They found that filled cylinders would mitigate against future damages better than sheetpile.

Damage in 2017, to the $3.4 million-road built to expansion site, almost resulted in land going into the water. Erosion was 6-7 feet from breaching the road and rails. $280,000 of Federal, State and Port funds went toward repair in 2017. During windstorms, water breaches over the road.

So far, $6.1 million was spent following 2017 storm. Resiliency funding to repair the lake portion of the west pier was $274,000. Repairs to operating docks cost over $4 million.

Upgrading west pier to increase resiliency will add $500,000 for sheet driven pile.

A total of $8.5 million of resiliency funds has been received.

Costs of operational downtime and lost revenue for off-lining the pier are not accounted for. For the Port, lost revenue is important because they employee people.

Dave noted that $25 million in municipal projects did not include port expenses.

Town of Oswego

Rick Kaulfuss presented as Supervisor for Town of Oswego. (Note: unfortunately, reception was poor and it was difficult to understand. Rick indicated that he would try to collect and send some information).

Rick commented that the joint ILOSLRB/GLAM presentation was great.

There were $200,000 in damages to culverts. $600,000 was received. Sewers were compromised. Sand and stone that was along shoreline had been washed out.

City of Oswego

(Note: Chief Randy Griffin followed-up after the meeting with the following email, with directions for obtaining a PowerPoint presentation and other documents.)

> *I have created a share point and added some of the documents from the 2017 flooding that you may find helpful in understanding the flooding impact in the City of Oswego. I am sending this link to give you access to those documents. I have also included two of our Deputy Chiefs that are managing both the Major Disaster Declaration as well as the State REDI program. It should be understood that only those projects that meet the respective funding requirements are included. All damages sustained above the 247'+ may not be completely captured.*
>
> *You were invited to join the Office 365 group "Oswego Recovery". This is a private group. Submit a request to the group owner to join the group by clicking the link below:* *https://outlook.office365.com/owa/OswegoRecovery@oswegony.org/groupsubscription.ashx?action=join&source=MSExchange/Loki&guid=1f4e1ec9-f785-4030-868c-6dedef6fea2f*
>
> *I hope that this information is helpful. We would be happy to follow up with another, smaller webex if you would find that useful to help the ILOSLRB/GLAM.*

Presentation continued:

The City of Oswego applied for two Fed declarations but only got one: a $7.4 million disaster declaration from FEMA in 2017.

Heavy erosion occurred in 2019.

$26 million in State funding was received.

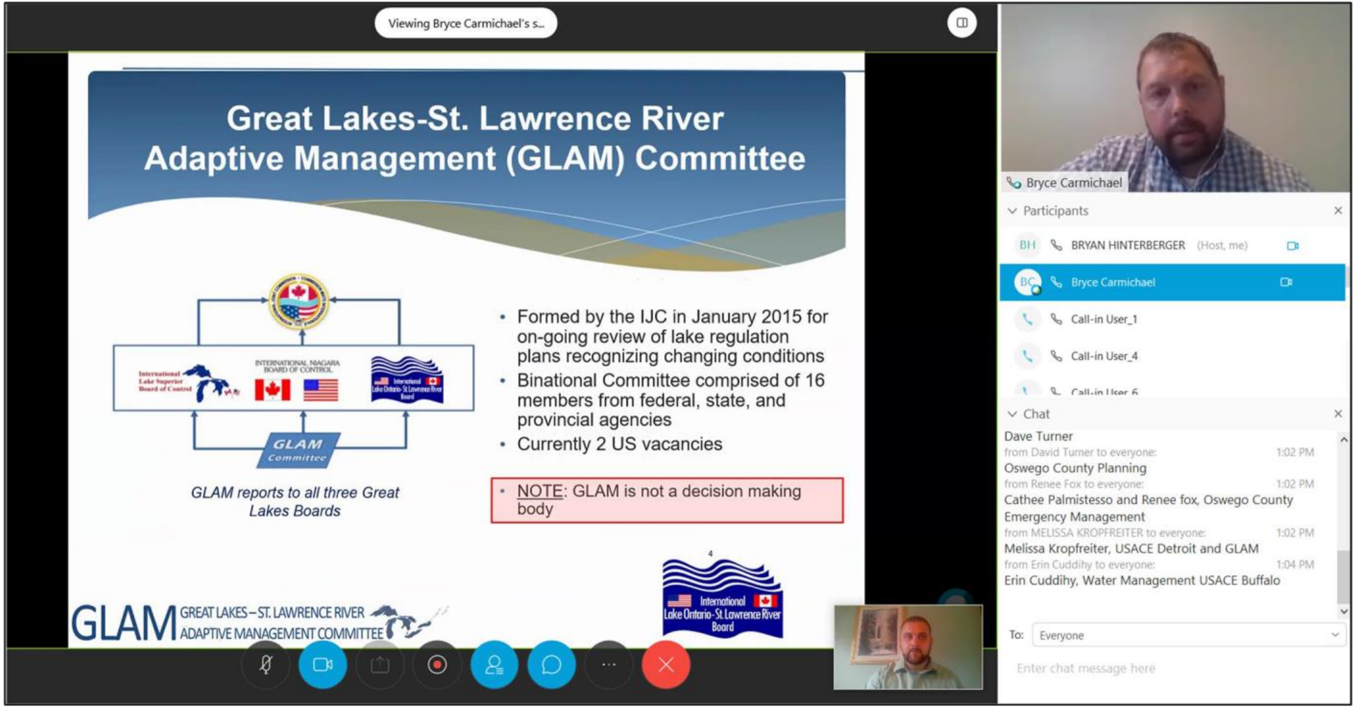
Within the breakwall, rip rap was pinned around the park as a mitigation measure with extra funding from FEMA.

The City was cited by DEC for wastewater release. The waste water treatment plant was inundated. They had to clean an affluent pipe that had been filled with debris due to wave action, and now inspect the pipe annually.

Damage response cost over $20 million, not including the economic loss of the canal system or marina closed.

Conclusion

Participants offered thanks for the meeting and a productive discussion and the meeting concluded.


Viewing Bryce Carmichael's s...
Bryce Carmichael
Participants
BRYAN HINTERBERGER (Host, me)
Bryce Carmichael
Call-in User_1
Call-in User_4
Call-in User_6
Chat
To: Everyone
Enter chat message here
International Lake Superior Board of Control
International Niagara Board of Control
International Lake Ontario-St. Lawrence River Board
GLAM Committee
GLAM GREAT LAKES – ST. LAWRENCE RIVER ADAPTIVE MANAGEMENT COMMITTEE
4

Great Lakes-St. Lawrence River Adaptive Management (GLAM) Committee

- Formed by the IJC in January 2015 for on-going review of lake regulation plans recognizing changing conditions
- Binational Committee comprised of 16 members from federal, state, and provincial agencies
- Currently 2 US vacancies

- NOTE: GLAM is not a decision making body

GLAM reports to all three Great Lakes Boards

Dave Turner
from David Turner to everyone: 1:02 PM
Oswego County Planning
from Renee Fox to everyone: 1:02 PM
Cathee Palmistesso and Renee fox, Oswego County Emergency Management
from MELISSA KROPFREITER to everyone: 1:02 PM
Melissa Kropfreiter, USACE Detroit and GLAM
from Erin Cuddihy to everyone: 1:04 PM
Erin Cuddihy, Water Management USACE Buffalo

Figure 1: Bryce Carmichael providing a virtual presentation to municipal representatives of Oswego County.

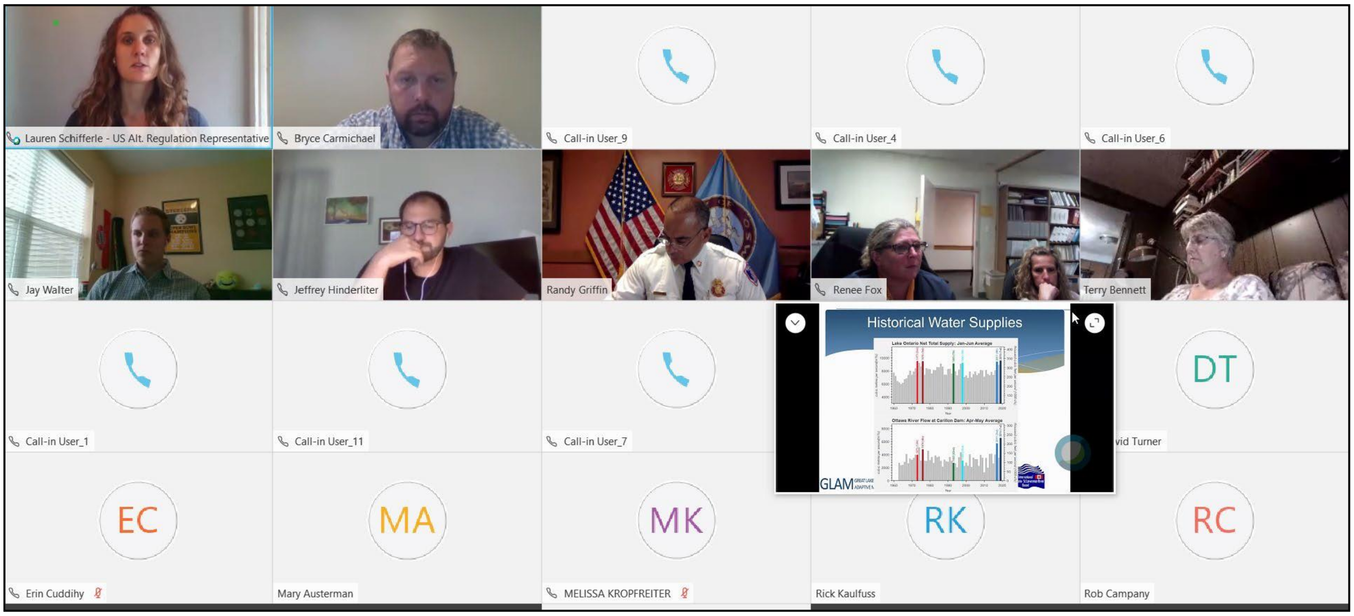


Figure 2: Lauren Schifferle providing a virtual presentation to municipal representatives of Oswego County.

IJC / ILOSLRB / GLAM / USACE 27 August 2020
Task #2 Engaging South Shore Lake Communities
20 August 2020 Virtual Meeting Summary
Wayne and Cayuga County Municipalities

Participants

- Bryce Carmichael (U.S. Secretary, ILOSLRB)
- Lauren Schifferle (U.S. Alternate Regulation Representative)
- Patricia Clavet (ILOSLRB member)
- Thomas Brown (ILOSLRB member)
- Mary Austerman (New York Sea Grant and GLAM)
- Bryan Hinterberger, Jay Walter, Mark Lester (Buffalo District, USACE meeting facilitators and support)
- Municipal stakeholder representatives
    - Jim Basile (Mayor of Village of Fair Haven)
    - Bruce Natale (Cayuga County Planning)
    - Dave McDowell (Mayor of Village Sodus Point)
    - Zakk Hess (Wayne County Emergency Management)

Location Virtual (Webex) meeting

Welcome and Introductions

This virtual meeting began with major technical difficulties, resulting in a late start.

Bryan convened the meeting and extended thanks to participants for time, patience, and willingness to adapt to the virtual meeting format. Bryan briefly described the purpose for the meeting, emphasizing the desire for an exchange of information and improved communication channels. Bryan also communicated the desire to create an atmosphere of a roundtable discussion, despite the virtual format.

U.S. Secretary for the ILOSLRB Bryce Carmichael and U.S Alternate Regulation Representative Lauren Schifferle made opening comments and welcomed participants**.** Participants introduced themselves. Bryan reviewed the agenda and the meeting proceeded.

Presentation

Bryce Carmichael and Lauren Schifferle provided the presentation.

Q&A

Mayor Jim Basile offered the following comments through the webex chat feature:

> *Damage to residential shoreline structure has been significant. No funding for this may also result in further property and structure damage down the road. Flooding has had a significant impact on the community and businesses. Especially for a summer destination community.*
>
> *Village of Fair Haven is 247.3 is when flooding issues begin. The higher the water the greater the impact becomes. The higher the water the more properties get drawn into the flooding. I am curious what the elevation is for the village of Sodus Point as they have areas generally lower than the Village of Fair Haven.*

Mayor Dave McDowell offered the following comments through the chat feature:

> *The Village of Sodus Point gets wet at 247.8 and trouble begins at 248. The high water events are driving all the older residents out of the village, millions of dollars (private and public) have been spent to get breakwalls built higher, homes raised, crawlspace damage repaired (twice as many cases).*

Comment from Bryce: How and where damages occurred are important for the model.

Comments from Jim: NYS Building Code via FEMA is required to build 2 feet above water mark (247.3’).

Comment from Jim: From what I have read, the dam does provide some benefit. What Fair Haven does not agree with is the shared effect of high water downstream, as is occurring on Lake Ontario.

Comment from Dave: Code enforcement officers should have a lot of data on shoreline impacts.

Question from Jim: What water elevation should we design and build to? We have struggled with this question. What should I tell residents?

Response from Bryce: There’s no clear guidance on this design standard and the IJC is not able to recommend an elevation.

Response from Bryan: If and when the Great Lakes Coastal Resilience Study is funded and comes to fruition, the resilient design elevation that you are requesting will be included as a main project objective (as the scope of the project is currently envisioned).

Comments from Dave: Studies take too much time and don’t lead to implementation or changes. People in the community are struggling. Elderly people are leaving and businesses are failing. There is a lot of water coming this direction, so we should be looking ahead. I’m more worried about the impact to lower water than high water. The stink will be terrible if the water get too low. At 242’everything will stink. Plan 2014 negates the possibility of looking at the impact of upstream conditions on the forecast. The board did show that they can adjust. I do appreciate the more recent releases (deviations) from the board.

Response from Bryce: Lake Erie is really the main driver. It’s very difficult to make decisions based on Lake Huron and Lake Michigan water levels because the uncertainty is very high. There were favorable ice conditions that allowed for the deviations.

Comment from Dave: The board and IJC should have better communicated the ice conditions [in reference to the favorable ice conditions].

Comment from Lauren: There was very minute and frequent tracking of changes during the deviations.

Comment from Dave: Dave was unsatisfied with the implementation of Plan 2014 and feels that not enough time and resources were provided to adapt to new conditions. They were very lucky that their area did not get hit with a big storm in 2019 during the high waters, because that would have been even more devastating.

Task #2 Engaging South Shore Lake Communities
20 August 2020 Virtual Meeting Summary
Wayne and Cayuga County Municipalities

You have good people on the PAG now. I hope the IJC listens to them. People were not listened to during the development of Plan 2014

Dave expressed frustration, but strong desire to work together and increase communication.

There was some discussion of releases from the Chicago River, with respect to Great Lakes Water Level regulation. Bryce and Lauren indicated that such releases were not a real option because of statutory limits and because downstream impacts in the Mississippi River Valley would have to be considered

Comments from Bryce: Actions taken (in response to high water events) will be reviewed and assessed by GLAM and recommendations will be made to the board.

Comment from Jim: People who owned properties during prior high water years (1993 & 1973), report that the flooding did not last for 4 months and caused less impacts. That is concerning.

Bryce and Lauren offered to research those previous high water events and provide a response.

Questionnaire Survey

Jay provided a brief explanation and overview of the survey of municipal impacts. Jay commented that we were having a good conversation and it all related to the survey. The survey is focused on municipal infrastructure. There are a few questions about damage to properties, but that is not the main focus.

Thresholds, dates and locations are important, as is information concerning differing causes of impacts such as wave impacts.

The GLAM would like to know about temporary and permanent measures taken to increase resilience, such as REDI-funded projects. There is a question in the survey about impacts to recreation and tourism, which can include any impacts to boating.

There is a separate, ongoing task related to recreation and tourism to collect information for GLAM.

Survey Discussion and Q&A

Comment from Jim: Please resend the survey so that it is at the top of our emails.

Bryan agreed to resend.

Municipal Presentations

Cayuga County

Bruce Natale presented on behalf of Cayuga County. The county owns over two miles of shoreline. 5-10 feet of shoreline was lost in some places as a result of the erosion. 1.5-3 tons of sand was lost from bluff erosion. Bruce suggested that the release of phosphorus lost from bluffs might have ecosystem impacts. Bruce wondered if the loading could lead to algal blooms that could also impact City of Oswego water quality. Bruce also wondered if the flooding had led to spread of invasive species such as water chestnuts.

Bruce inquired why the full capacity of the St. Lawrence Seaway was not used. Lauren described the evaluation of outflows with respect to impacts on both upstream and downstream interests.

Wayne County

Zakk Hess expressed, on behalf of Wayne County, that Mayor Dave McDowell with the Village of Sodus Point (a meeting participant) was the most knowledgeable. Zakk expressed support for comments made by Dave.

Zakk inquired about the status of existing fine resolution, LIDAR datasets and the intention to collect new LIDAR data. Bryce, Bryan and Mary described familiarity with a multi-agency technical working group that had collected recent LIDAR data. Bryce described familiarity with recent, nearshore vegetation mapping. Mary offered to email a contact with NOAA, copying Bryan, and Bryan agreed to follow-up with the meeting participants with any responses on the status of the data. Bryce also mentioned that LIDAR was collected in 2017, but had not been processed.

Village of Sodus Point

Mayor Dave McDowell spoke of behalf of Village of Sodus Point. Dave indicated that he will complete the survey. Over $10 million has been spent to increase resiliency, not including funding for businesses and residences. He is satisfied with amount received from the State, but there is still more to do. Most of that amount ($7.4 million) went to a storm water management system. Groundbreaking will occur in September 2020. The system will keep the village dry and will be able to pump 1 million gallons/hour. Residents have spent significant State and private funding to build up walls.

Other State funds went toward three resilience projects: one restoration of a sand dune with planted beach grasses, and two stone revetments to protect vulnerable areas near manholes, near receded shoreline. Dave commented that natural shorelines do no hold up in the area.

Other locations were not selected for State money. Dave indicated that he can show (ILOSLRB/GLAM) areas that have been impacted that still need repair.

Comment from Bryan: The original intent, before the COVID-19 shutdown, was to include some municipality-led site visits as an option during the face-to-face meetings. I will convey your offer to host site visits at some point in the future to the GLAM.

Village of Fair Haven

Mayor Jim Basile added a few more details on behalf of the Village of Fair Haven. Stormwater repairs occurred in the Town of Sterling. $5 million was spent.

Conclusion

Participants offered thanks for the meeting and a productive discussion and the meeting concluded.

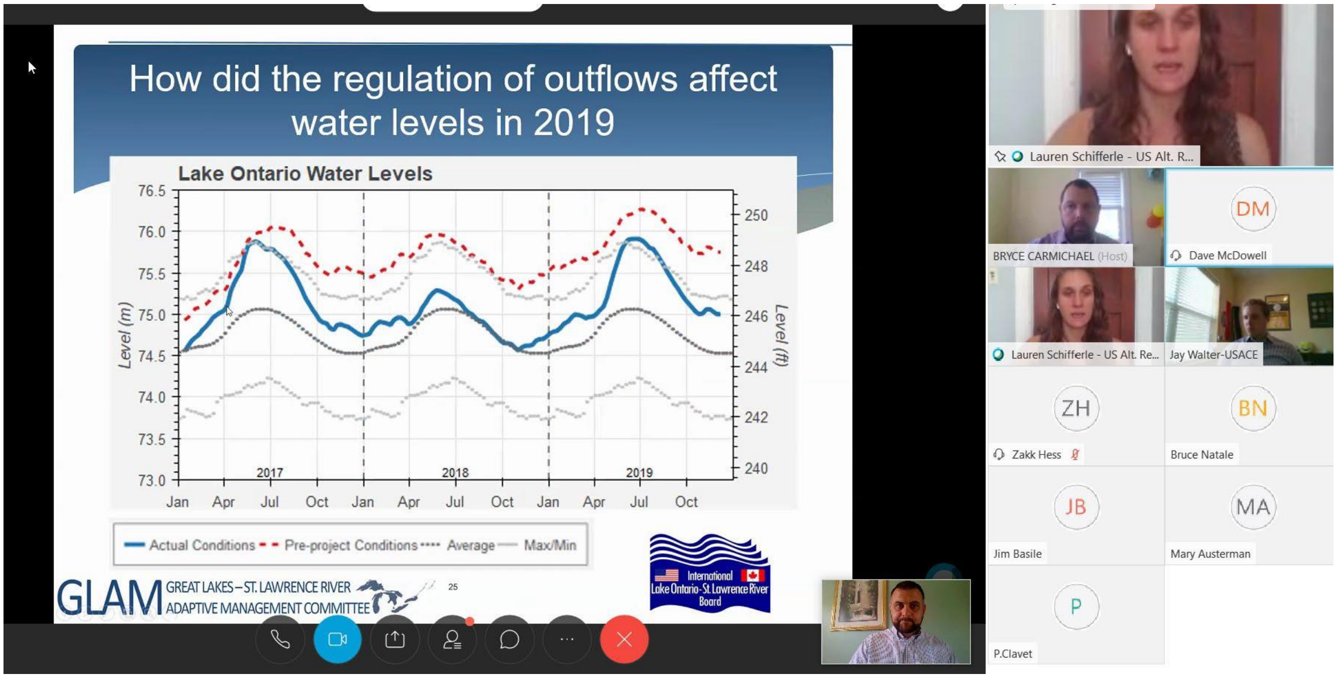

How did the regulation of outflows affect water levels in 2019
Lake Ontario Water Levels
Level (m)
76.5
76.0
75.5
75.0
74.5
74.0
73.5
73.0
Level (ft)
250
248
246
244
242
240
2017
2018
2019
Jan
Apr
Jul
Oct
Actual Conditions
Pre-project Conditions
Average
Max/Min
GLAM GREAT LAKES – ST. LAWRENCE RIVER ADAPTIVE MANAGEMENT COMMITTEE
25
International Lake Ontario-St. Lawrence River Board
Lauren Schifferle - US Alt. R...
BRYCE CARMICHAEL (Host)
DM
Dave McDowell
Lauren Schifferle - US Alt. Re...
Jay Walter-USACE
ZH
Zakk Hess
BN
Bruce Natale
JB
Jim Basile
MA
Mary Austerman
P
P.Clavet

Figure 1: Lauren Schifferle providing a virtual presentation to municipal representatives of Wayne and Cayuga Counties.

IJC / ILOSLRB / GLAM / USACE 11 September 2020
Task #2 Engaging South Shore Lake Communities
31 August 2020 Virtual Meeting Summary
St. Lawrence County Municipalities

Participants

- Bryce Carmichael (U.S. Secretary, ILOSLRB)
- Lauren Schifferle (U.S. Alternate Regulation Representative)
- Bryan Hinterberger, Jay Walter, Tim Noon (Buffalo District, USACE meeting facilitators and support)
- Municipal stakeholder representatives
    - Andrea Smith(City of Ogdensburg, Director of Planning and Development)
    - Matt Denner (St. Lawrence County, Director of Emergency Management)
    - Mike Zagrobelny (Mayor of Village of Waddington)

Location Virtual (Webex) meeting

Welcome and Introductions

(Note: During pre-meeting conversation, Andrea and Matt mentioned that most towns and villages within the County do not have full-time staff and that Town Supervisors typically maintain other full-time jobs during normal business hours. Matt commented that he has had difficulties scheduling daytime meetings with these participants in the past.)

Bryan convened the meeting and extended thanks to participants for time and willingness to adapt to the virtual meeting format. Bryan briefly described the purpose for the meeting, emphasizing the desire for an exchange of information and improved communication channels. Bryan also communicated the desire to create an atmosphere of a roundtable discussion, despite the virtual format.

U.S. Secretary for the ILOSLRB Bryce Carmichael and U.S Alternate Regulation Representative Lauren Schifferle made opening comments and welcomed participants**.** Participants introduced themselves. Bryan reviewed the agenda and the meeting proceeded.

Andrea Smith introduced herself as the Director of Planning and Development for the City of Ogdensburg. In her role, Andrea has been the primary point of contact related to flooding and impacts. Her duties have included preparation and management of grant applications, and taking inventory of on-the-ground conditions and damages to municipal and residential property.

Matt Denner introduced himself as the Director of Emergency Management for St. Lawrence County. He is responsible for assisting all villages and towns with flooding issues. Matt moved into this position, following previous employment with the City of Ogdensburg, in late 2019.

Presentation

Bryce Carmichael and Lauren Schifferle provided the presentation.

Q&A

Matt and Andrea both commented that the presentation was great and that the data and charts were informative and interesting. Andrea added that the presentation clearly explained why the water levels are what they are.

IJC / ILOSLRB / GLAM / USACE 11 September 2020

Task #2 Engaging South Shore Lake Communities
31 August 2020 Virtual Meeting Summary
St. Lawrence County Municipalities

Comment from Andrea: The survey is long and in-depth. I didn't get through it entirely because it is so long. I have a better appreciation for why you're looking for this information now, following this presentation. I don't know if I can answer all questions, but we can try to keep working. If you'd like us to do so, what's the timeframe?

Response from Bryan: We are trying to collect surveys for a report due by the end of September, so responses received in the next two weeks would be most helpful. The GLAM would like to permanently improve communication channels, so please just send as much information as you can, when you can.

Andrea asked Matt if he had information about the quantity of sandbags.

Matt responded: We staged them, but didn't use them at all, in 2020. I have the quantities for 2019. (Note: Matt sent an email and attachment with the following information: Sand Bags for 2019, Hammond 3,140, Ogdensburg 1,320, Oswegatchie 400)

Comment from Bryce: Anything you can provide is helpful and will fill in gaps. We appreciate the efforts.

Comment from Matt: We have not completed the survey and probably will not, as the municipalities would have greater access to the requested information.

Bryan requested that Matt take another look at the survey to assure that the County did not have access to any of the requested information and Matt agreed.

Comment from Andrea: That survey is very long and daunting. There are many pages and many questions that would require personnel from multiple departments to answer. Coming from someone whose job it is to complete this kind of paperwork, I doubt you'll get strong response because so many people [in the towns] only work part time and you are asking for such detail. Most people won't have time to complete this survey.

Bryan commented that even that input is very important input for the GLAM.

Matt alluded to a PowerPoint presentation that he had given to the towns that contained some data collected by the State. Matt offered to send the presentation to Bryan.

Andrea commented that the graphics in the presentation are helpful for communication within her community. Some people think that flooding will never occur again. Some, including council members, don't understand why the state is spending money on resiliency measures. The presentation effectively describes the volume of the water that passes through.

Question from Andrea: What are the projections of types of flooding and water levels that we can reasonably expect?

Bryce responded: Any time you have a community along a large body of water, there will always be some risk. Even if good conditions persist for decades, there will always be the possibility of catastrophic events. In 1973 there were high waters, although flooding was not as bad as in 2017 and 2019.

We don't know when, because there is too much uncertainty in the forecast, but a chance of recurrence is pretty much guaranteed. The Ottawa River is major factor, along with Lake Erie levels. With a 50% trend line, the likelihood of having catastrophic event next year is possible but not likely. The closer we get to spring, we'll have a better idea of the risk.

The board has taken action through extended deviation authority, which helped. The board has learned from that, will constantly assess risk, and see if more can be done.

As you're talking to elected officials, it is important to emphasize that every community with body of water faces that risk. It is expensive to put in resiliency measure but very important.

Comment from Andrea: During the height of the flooding, we heard a lot about flooding being the direct result of Plan 2014. There was a pretty consistent response [from the board] that Plan 2014 was not the cause, and that high water was solely related to precipitation and hydrology of the system. I've seen more recent correspondence about relooking at 2014 and making changes. Is that happening? Is [Plan 2014] being removed? Is there thought that there could be changes? If so, that's a departure from the original response that Plan 2014 was not the cause.

Response from Bryce: In 2019 the board took action and deviated from plan, and pushed as much water as could while balancing impacts upstream and downstream. There are a lot of limiting factors. There is just no effective measure for getting water out of the system. The review will include a consideration of limits, and whether a few inches can be allowed over a long timeframe during critical elevations. GLAM will be looking at plan limits and deviations and making recommendations during the expedited review concerning actions that could help a little bit during high water levels. We were pretty lucky that the winter was mild and that deviation did not butt against ice limits. There is a tiny amount of wiggle room within the regulation plan. Those are the edges that are being explored now.

Lauren: When Plan 2014 was adopted, it established GLAM and included a 15-year review. The review is now being expedited in response to the flooding. The flooding was a terrible coincidence of timing with the establishment of Plan 2014. It was a tremendously wet year. April and May were wettest months ever recorded, and fall in the most critical period of year. There was an evaluation that compared the old plan with new plan to determine the hypothetical difference. Plan 58d would not have operated any better than Plan 2014. No plan would eliminated flooding. Tweaks are being looked at. Actions taken may influence water levels by centimeters.

IJC / ILOSLRB / GLAM / USACE 11 September 2020
Task #2 Engaging South Shore Lake Communities
31 August 2020 Virtual Meeting Summary
St. Lawrence County Municipalities

Questionnaire Survey

Jay provided a brief explanation and overview of the survey of municipal impacts. Jay commented that we were having a good conversation and it all related to the survey. The survey is focused on municipal infrastructure. There are a few questions about damage to properties, but that is not the main focus.

Thresholds, dates and locations are important, as is information concerning differing causes of impacts.

Jay emphasized that we understand that other surveys have been completed and that we don't want to create extra work for anyone. Municipalities are encouraged to use the existing data that has been provided to other agencies.

The GLAM would like to know about temporary and permanent measures taken to increase resilience, such as REDI-funded projects. There is a question in the survey about impacts to recreation and tourism, which can include any impacts to boating.

There is a separate, ongoing task related to recreation and tourism to collect information for GLAM.

Survey Discussion and Q&A

Matt reiterated that these questions really need to be answered by municipalities, and that he could not fill them in.

Jay explained that we do not really expect that every town would be able to answer every question.

Andrea commented that it is helpful to know that we are not expecting a response for every question.

Municipal Presentations

St. Lawrence County

Matt explained that the municipalities would have more specific information on the damages incurred and actions taken to increase resiliency.

Matt transitioned into his current position with the County in October of 2019 and was more familiar with the impacts and actions taken in Ogdensburg, where he was previously employed. Matt deferred to Andrea on those details. Matt commented that the work being done in Ogdensburg looks amazing.

Matt explained that the Town of Hammond suffered erosion and damage to private residential properties. Town of Morristown did not have much damage at all. The Town of Oswegatchie has a small section of water front, which contains homes and camps that were flooded. Toward Lisbon, near Iroquois dam, there was not much flooding.

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Village of Waddington

Mayor Mike Zagrobelny spoke of behalf of Village of Waddington. Waddington is unique in the fact that it is located between two dams. Water levels are dependent on what gets “sucked through” at Massena and “held up” at Iroquois. Waddington experiences low water levels sometimes when others have high water.

The lack of consistency and fluctuations causes the most damage. Since Waddington is in the range of the New York Power Authority, there are no businesses along the shore. When there is flooding or low water, the effect is to the homeowners. Waddington did received a grant for the water and sewer plant. Sewer lines are close to the river. When water levels rose and the sewer pipe was infiltrated. REDI [funding] will address that problem.

Fluctuation of water levels causes a lot of damage in the village. At Burkview drive, water levels in spring might go up or down 2.5 feet per day. There is erosion in areas where the Power Authority has not come through with shoreline protection. Adjacent homeowners don’t actually own the shoreline, but they have access and their property values and taxes are reflected by the erosion. NYPA owns the property up to an elevation of 245’.

It would be difficult to complete survey questions without surveying waterfront homeowners, and it would be difficult to quantify losses on properties. It would also be difficult to quantify loss of revenue.

Matt commented that Ogdensburg was really the only municipality that owns property and incurred damage in St. Lawrence County. A lot of waterfront property is privately owned in other towns.

City of Ogdensburg

Andrea Smith presented on behalf of the City of Ogdensburg. Andrea agreed with Matt that Ogdensburg has a lot of waterfront owned by the municipality and some residences. It is not a seasonal community.

Andrea referenced a map that depicts where damage occurred. See Figure 1 below. Most residential damage was due to erosion. There was substantial damage to residential properties, particularly in the eastern part of city. A lot of the city-owned property is parkland, but is not designed to flood. Structures were not designed to handle inundation, and 50-60 feet of a seawall was severely damaged and compromised adjacent property. Ogdensburg is receiving funding through the REDI program for these locations.

Bryce and Lauren both commented that the map is very helpful.

Some primary residential properties did not sustain damage to the home, but did incur severe shoreline erosion. In some cases entire backyards were removed, docks and boathouses damaged, but no damage was done to the home because of the elevation. These homes were determined to be ineligible in 2019 for the State relief program, even though in some instances over $100,000 in damages occurred to seawalls, docks, or boathouses.

Similar issues occurred on Covington Street, including erosion and damage to docks.

Some significant infrastructure is located along the water front. The Main Street pump station and East River Street pump station was damaged in 2017 and 2019. The waste water treatment plant is also located nearby, but incurred no damage per se.

There are concerns about the future performance of the water intake because it was designed in 1912.

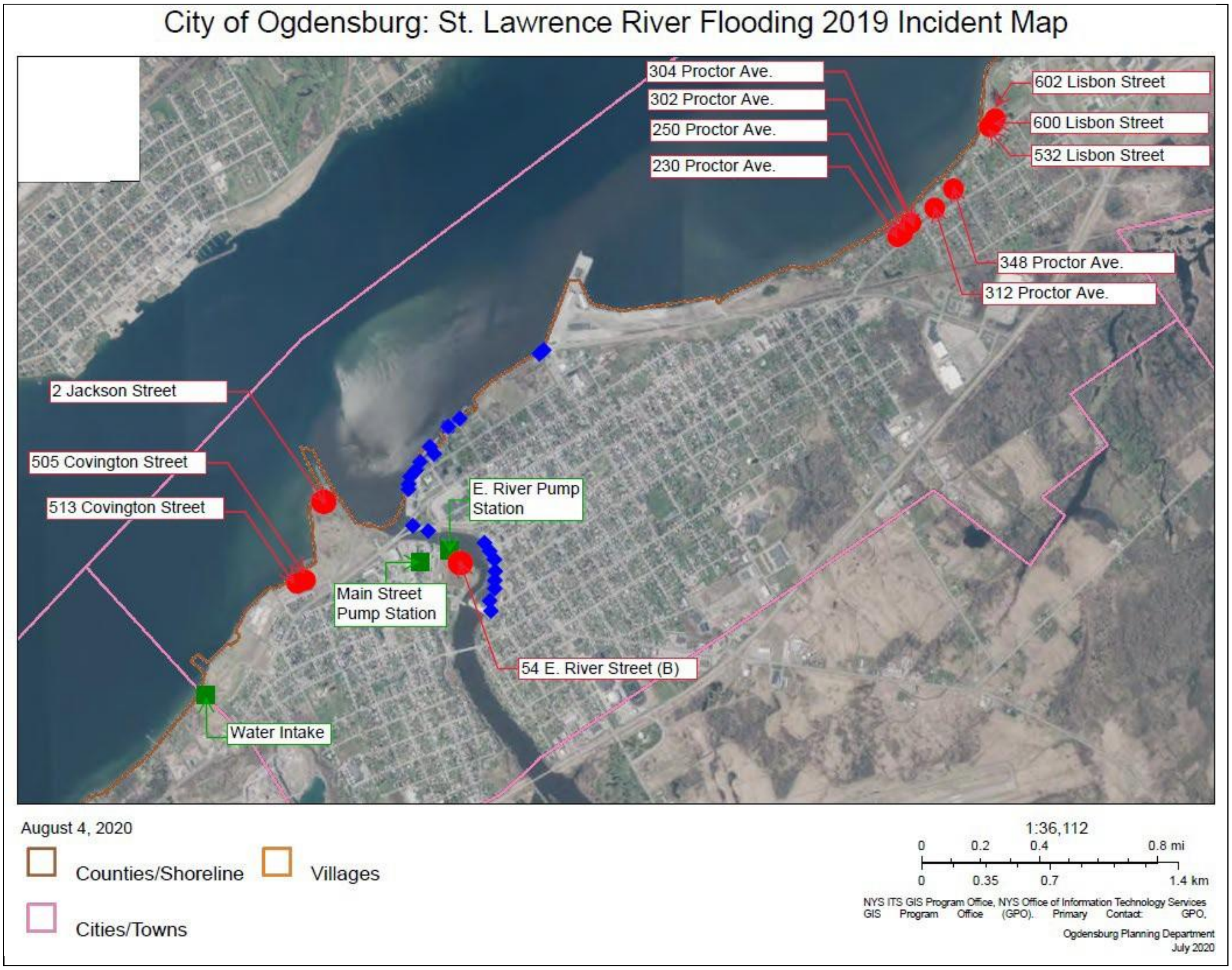


Figure 1. Andrea Smith referenced this Flooding Incident Map during her presentation. Blue diamonds depict the extent of damage to municipal parkland.

On the right side of bend of the Oswegatchie River, near the Maple City trail, there is a seawall that was significantly damaged.

There is a dam on the Oswegatchie River. When the St. Lawrence River is high, it backs up to the dam. As a result, there is a little stretch where extreme volumes of water destroyed both sides of the river. The City owns the east side, where damage was worse, but the private property on the westside bank was also significant.

The blue dots on the map, along the St. Lawrence River, indicate parkland where shoreline stabilization projects are being implemented. Actions include elevating parkland and installation of rip rap and/or sheetpile with State funding.

There was discussion about ownership of the dam. It is privately owned by Ampersand. Matt explained they do not have storage capacity. When they close the dams and it just slows down the river and raises water levels upstream.

Matt observed that Oswegatchie flows are extreme in the spring. During flooding, huge slabs of concrete were picked up and tossed.

Follow-up conversation

Question from Mike. There are many boaters in my town and they would like to know if there is plan to change the plan [Plan 2014]. Note: Mike joined the call late due to a scheduling conflict and missed the presentation.

Lauren: Part of Plan 2014 included a 15 year review, which is now being expedited. It is uncertain what the recommendations resulting from the review will be, but it is unlikely there would be any broad changes.

Bryce explained that part of the board’s deviation strategy was to allow Lake St. Lawrence to remain 16 inches above the low limit this summer, to remain higher to help with recreational boaters.

Levels were adjusted downward just last week. To help alleviate impacts, there is an opportunity to reduce reductions and raise water levels to help people get their boats out of the water. The review process will definitely consider boater and recreational users. The board is aware that local economies rely heavily on recreational boating. The GLAM is looking to collect information on recreational boating as a component of the review of Plan 2014, to better understand impacts and what can be done to help.

Comment from Mike: I appreciates meeting and the information. In Waddington, people are cognizant of the water fluctuations because the foundation of the old milk plant becomes more or less visible, and acts as a daily and hourly barometer. The public has great awareness of water levels.

Lauren inquired with the participants: Are there things in terms of communications that can be done better or are working well?

Matt responded that communications have been great. The state also provides weekly updates and numbers.

Andrea responded that the webinars that the IJC was doing in 2019 and into 2020 were very helpful. The weekly emails were also helpful, and they were included as links on the city website. People knew that we were sharing the information that we had.

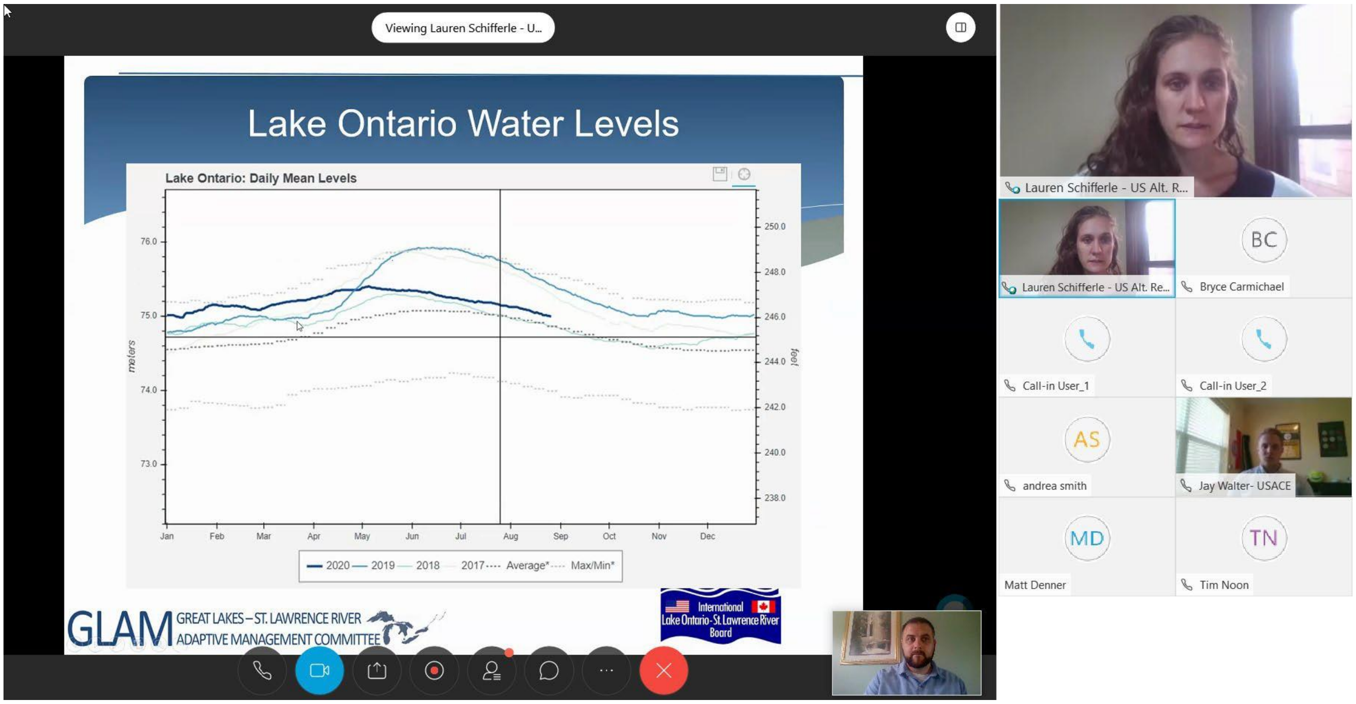
Communication was not as good in 2017, probably because we were all getting used to the event. Communication was much better in 2019. The regularity of the communication has been very good.

Matt agreed.

Bryce inquired, and Bryan agreed, to send the ILOSLRB email address. Bryce suggested that participants could always email and send a question.

Conclusion

Lauren and Bryce thanked participants their time and joining the meeting. Participants offered thanks for the meeting and a productive discussion and the meeting concluded.


Viewing Lauren Schifferle - U...
Lake Ontario Water Levels
Lake Ontario: Daily Mean Levels
76.0
75.0
74.0
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meters
250.0
248.0
246.0
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242.0
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238.0
feet
Jan
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Nov
Dec
2020
2019
2018
2017
Average*
Max/Min*
GLAM GREAT LAKES – ST. LAWRENCE RIVER ADAPTIVE MANAGEMENT COMMITTEE
International Lake Ontario-St. Lawrence River Board
Lauren Schifferle - US Alt. R...
Lauren Schifferle - US Alt. Re...
BC
Bryce Carmichael
Call-in User_1
Call-in User_2
AS
andrea smith
Jay Walter- USACE
MD
Matt Denner
TN
Tim Noon

Figure 2: Lauren Schifferle providing a virtual presentation to municipal representatives of St.Lawrence County.

IJC / ILOSLRB / GLAM / USACE 6 October 2020
Task #2 Engaging South Shore Lake Communities
21 September 2020 Virtual Meeting Summary
Jefferson County Municipalities

Participants

- Bryce Carmichael (U.S. Secretary, ILOSLRB)
- Lauren Schifferle (U.S. Alternate Regulation Representative)
- Bryan Hinterberger and Jay Walter (Buffalo District, USACE meeting facilitators and support)
- Municipal stakeholder representatives
    - Michael Bourcy (Planning Director, Jefferson County)
    - Scott Gray (Jefferson County Legislator)
    - Bobby Cantwell (Jefferson County Legislator)
    - Phil Reed (Jefferson County Legislator)
    - Sarah Baldwin (Deputy, Jefferson County)
    - Eric Constance (Mayor, Village of Sackets Harbor)
    - Bob Hagemann (Jefferson County Administrator)
    - Jim Lawrence (Jefferson County Highway)
    - Doug Shelmidine (Supervisor, Town of Ellisburg)
    - Lance Peterson (Supervisor, Town of Clayton)
    - Robin Grovesteen (Assistant to the Supervisor, Town of Lyme)

Location Virtual (Webex) meeting

Welcome and Introductions

Bryan convened the meeting and extended thanks to participants for time and willingness to adapt to the virtual meeting format. Bryan briefly described the purpose for the meeting, emphasizing the desire for an exchange of information and improved communication channels. Bryan also communicated the desire to create an atmosphere of a roundtable discussion, despite the virtual format.

U.S. Secretary for the ILOSLRB Bryce Carmichael and U.S Alternate Regulation Representative Lauren Schifferle made opening comments and welcomed participants**.**

Bryan thanked County Legislator Scott Gray and his staff member Torri Richmire for helping to organize and schedule the meeting. Scott attributed the effort to Torri and echoed the thanks. Scott also mentioned the importance of the call for multiple reasons, including the significant amount of investment that is being made on the waterfront area, as well as concerns and questions about plans and mitigation efforts.

Participants introduced themselves. Bryan reviewed the agenda and the meeting proceeded.

Presentation

Bryce Carmichael and Lauren Schifferle provided the presentation. (Note: Torri Richmire had inquired prior to the meeting, on behalf of an interested participant, if the presentation would be recorded. After first consulting with the presenters, Bryan responded that the presentation would not be recorded).

Q&A

Mayor Eric Constance commented: We keep hearing that water is coming from the western Great Lakes and they are higher than normal. We're being told there could be two years of higher water coming at us.

Lauren response: The upper lakes are high and setting records. That water takes up to several years to reach Lake Ontario and in that time, weather will play a major factor. Just because water is high on Lake Michigan now, does not mean that water will be high coming into Lake Ontario. If there's a dry year, there will be a lot of evaporation of that water.

Eric Constance asked: In 2017 we had a lot of sand bagging going on and a lot of individuals trying to figure out how to protect their cottages. We've had roads washed out and we had our main dock area under water during those two years [2017 and 2019]. There were warnings going into this year that the same thing was going to happen again, yet it didn't. What changed?

Lauren responded: Compared to 2017 and 2019, there were different precipitation conditions and ice conditions. There were concerns last winter that spring conditions would be the same if we received similar precipitation. It was a drier spring and we didn't have the perfect storm of conditions. There is always concern with the randomness and probability.

Bryce also responded: The Regulation Plan does consider inflows from Lake Erie through Niagara River.

Scott Gray asked (via webex chat): Are these graphs available monthly so we may plan accordingly?

Bryce responded: Forecasts are updated weekly on the Board's website and hydrographs are updated periodically. Lauren posted the following link on the webex chat: https://ijc.org/en/loslrb/watershed/forecasts

Supervisor Lance Peterson commented: I don't have any questions. When high water hit our community [Town of Clayton], it flooded our downtown historical District which houses retail, restaurants and residences. In the short season that we have, a lot of them were rendered useless. Restaurants couldn't operate because of health code issues.

Tremendous work has been done to treat mold and mildew even after the water receded. 2019 was devastating. Homeland Security was a great help with sandbagging. They did everything they could do. At Grindstone Island we had a bridge at the foot of the island that was flooded. The Town of Clayton had to barge trucks over with gravel to build up bridge because people at the foot of the island couldn't get access to the rest of the island. It made for a dangerous situation. There hasn't been compensation but hopefully REDI will help. It's difficult to work during high waters. You've made it clear that you can't predict the water and you can't predict the flow, but you're doing the best you can and I'm sure you're well aware [of the challenges being explained].

Properties along the shore and on islands were rendered useless when their docks were underwater two of three years. Owners are looking for tax reassessments which would be financially devastating for the small community.

We are looking to address much of this with REDI grants to protect the historical District and shorelines that have deteriorated, including the Harbor Hotel (which is an economic engine for the community). We are hoping for low water to complete projects over two or three years. We are hoping the river can be managed and maintained at good levels.

Lance offered thanks for putting this meeting together and commented that it is helpful for both the municipality and for the private sector.

Bryce inquired and Lance clarified that water levels this year had not prevented construction. High waters are more of an ongoing concern for future years. They want to be prepared for future years.

Bryce added that forecasts in January and February will give a much better idea of what water levels to predict during the spring. The closer to spring we get, the better the forecasts will be.

Questionnaire Survey

Jay provided a brief explanation and overview of the survey of municipal impacts. Jay commented that we were having a good conversation and it all related to the survey. The survey is focused on municipal infrastructure. There are a few questions about damage to properties, but that is not the main focus.

Thresholds, dates and locations are important, as is information concerning differing causes of impacts.

Jay emphasized that we understand that other surveys have been completed and that we don’t want to create extra work for anyone. Municipalities are encouraged to use the existing data that has been provided to other agencies.

The GLAM would like to know about temporary and permanent measures taken to increase resilience, such as REDI-funded projects. There is a question in the survey about impacts to recreation and tourism, which can include any impacts to boating.

There is a separate, ongoing task related to recreation and tourism to collect information for GLAM.

Survey Discussion and Q&A

Bryan encouraged all participants to follow-up with him to seek any additional clarifications about the survey. No questions or comments were received.

Municipal Presentations

Town of Ellisburg

Supervisor Doug Shelmidine presented on behalf of the Town of Ellisburg: We didn't have municipal property damage. The town's 10.25 miles of shoreline is State or privately owned. The State-owned wetlands area has been protected to point that it is choking with vegetation growth. There is no capacity to allow for excess water. I'm guessing vegetation has grown fast this summer.

One marina took it upon itself to raise docks and cottages. They took many actions to be able to operate during higher water levels.

The Town has expedited the permit process [for shoreline protection]. Many shoreline owners took advantage of the lower levels this year [for construction].

We did have huge dune loss that will take generations to reestablish.

Town of Clayton

Supervisor Lance Peterson commented on behalf of the Town of Clayton: I don't have much to add to the detail I had already provided. I would like to clarify that the Harbor Hotel is owned by municipality. The bridge in Grindstone is also a municipal concern and we are looking forward to getting the project done.

Town of Lyme

Robin Grovesteen presented on behalf of Town of Lyme: Town of Lyme suffered a lot of damage in 2017, and was fortunate to leverage funding from the Office of Renewal. We were able to get some work reimbursed through FEMA (maybe $50,000). We are waiting reimbursement of few more $100,000. We have been working with Homeland Security to be reimbursed and have regular calls on Tuesdays. The requirements are unwieldy. One issue is that that we don't have photos of pre-event conditions to support requests for reimbursement.

We do have a lot of municipal-owned shoreline.

Bryce: we have a repository of aerial imagery from 2017 along the coast. That might be something you could look at [to support reimbursement request]. I'll look into it and Bryan can follow-up with you.

Bryan asked and Robin explained that she is the Assistant to the Town Supervisor and does a little of everything. The Town Supervisor has a full-time job and can't attend things like afternoon webinars.

Robin commented: It's unfortunate that more people don't avail themselves of the available facts. Some folks are just looking for someone to blame, and it is not due to failure to disseminate information. The old information prior to regulation is pretty informative. When you look at the before and after charts [from the presentation], you can see that we shouldn't be just naming one party or committee for the damage.

Village of Sackets Harbor

Mayor Eric Constance presented on behalf of Village of Sackets Harbor: There are two major projects with REDI and FEMA money, at a cost of close to $4 million altogether. We have started one of the projects down at Brown Shores Road, where we got prevailing winds that washed that road out in 2017 and 2019. We are in the process of rebuilding the road, building a new culvert, and adding riprap and a seawall. Some of the manhole covers will be changed out. We partnered with the Town of Hounsfield and were able to get started with FEMA money. We are hoping REDI money comes through to complete Phase 1 and hoping to complete the project in the spring.

The second project is the Market's Square Park project. We have docks in a nice public area that was under water in 2017 and 2019. We have a sheetpile wall that needs to be replaced and a lot of site restoration.

We are looking to raise areas near Brown Shore Road by 2 feet, including a parking area.

We also have two boat launches that need to be refurbished. We are putting in floating docks to receive more boats and putting in a kayak launch station.

We are hoping to go out for bid in spring. One concern is that many projects will be coming on line at the same time, and there may not be available marine contractors to do all the work at that time.

There were also issues with individual seawalls. Three businesses (Navy Point Marina, Madison Barracks Marina, and a restaurant) were all approved for REDI; they lost docks and a wall was breached. There were underwater docks at the restaurant.

Follow-up conversation

Lauren commented: I'm sure you're getting survey fatigue. We can't access info you've provided to FEMA and the State, but you can send that information to us. Any information you can provide will greatly help the Board to make future decisions, especially related to dates and elevations.

Bryce echoed that we really appreciate any effort made to fill in information gaps. Bryce also mentioned that [respondents] don't have to answer every survey question.

Bryce invited pariticipants to email him in the future and suggested that Bryan would provide the address.
ILOSLRB-USSection@usace.army.mil

Scott Gray commented: Thanks for your time and your effort. This is the second or third time I've heard Lauren present and she has insightful information.

Mike Bourcy entered a question in the chat feature: Will this presentation be available for use by municipalites that could not attend?

Bryan responded: I will preparing a meeting summary. The audio has been recorded only for the purpose of preparing a meeting summary, but the presentation was not recorded. The slides were sent in advance of the meeting to the municipal representatives.

Bryce clarified that one slide from the presentation had been updated, with an updated forecast.

Lauren commented: If neighboring municipalties have questions about the presentation, they can give me or Bryce a call.

Bryce posted a link in the to the coastal viewer in the webe chat feature [following-up from previous point of discussion]. He explained there has been a joint effort between NOAA and USACE to focus on aerial imagery across the Great Lakes. In 2016, they did collect impagery from Chaumont Bay. The link will lead to specific images and it is a good tool for viewing conditions at locations in previous years.

https://geodesy.noaa.gov/storm_archive/coastal/viewer/

Doug Shelmidine asked: Could you please send contact info for the speakers for the future?

Bryan responded: I'll send an email address for the ILOSLRB that will connect you with the Secretaries for the Board, including Bryce. ILOSLRB-USSection@usace.army.mil

Bryce: If you have a question and I don't have an answer, I'll connect you with the right person.

Comment from Lance Peterson: Thanks again for your time and effort. It helps us to rest easier knowing that you're thinking about us and our communities.

Bryan emphasized that one of the purposes of the meeting was to reestablish communication channels going into the future and thanked everyone again before concluding the meeting.

The following input was received via email by County Legislator Phil Reed following the meeting:

Today's meeting was informative and productive. Please add me to future meetings and correspondences. I am a Jefferson County Legislator representing the Towns of Orleans, Alexandria and part of Leray. I have also served on the Great Lakes Commission at the time when Plan 2014 was going through the vetting process. Please feel free to contact me at any time.

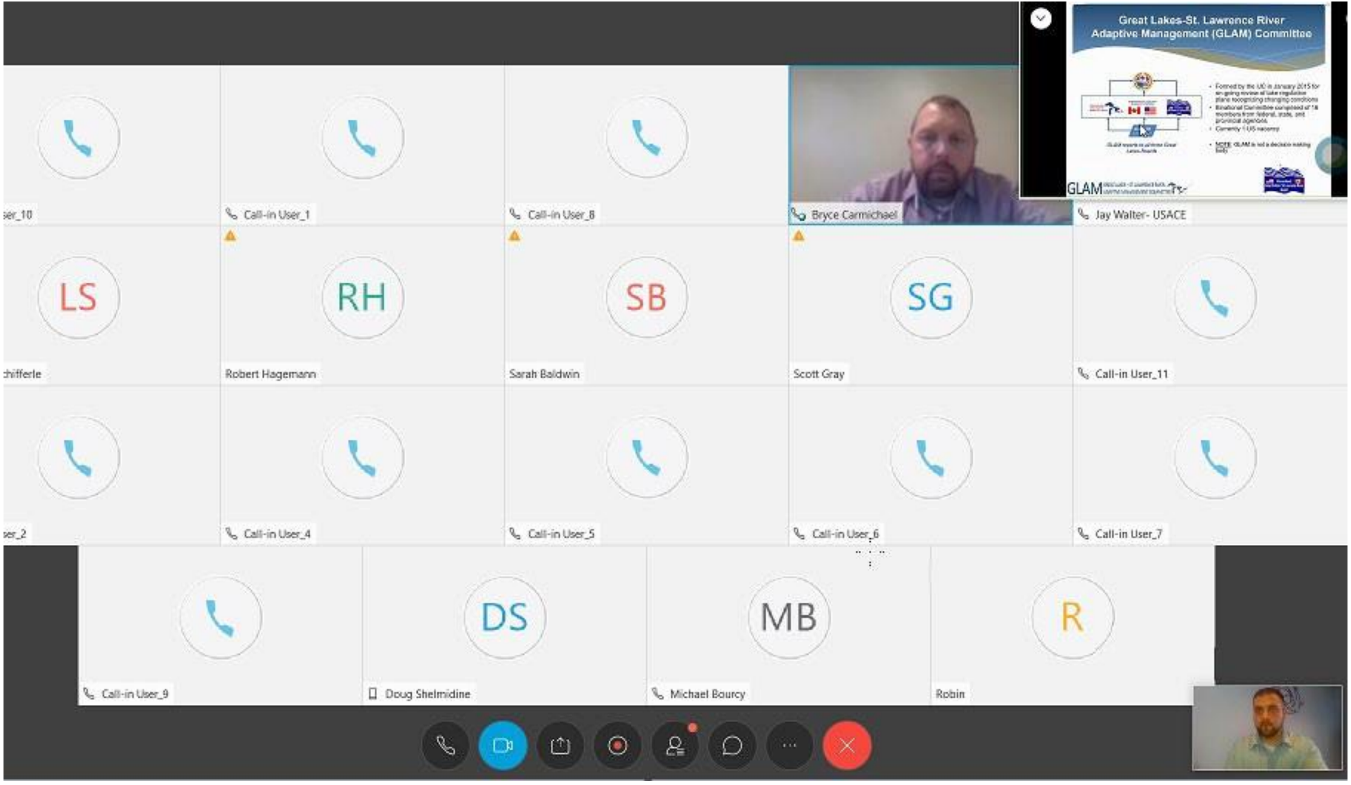
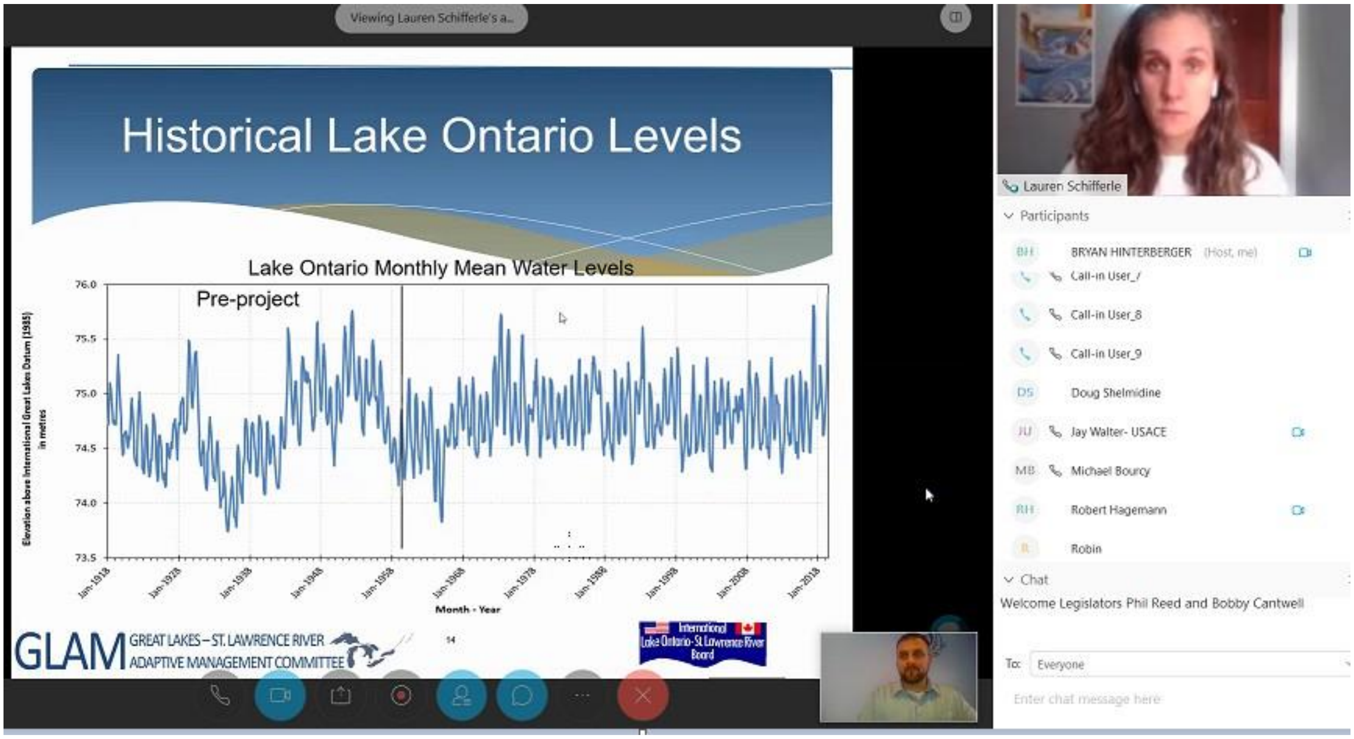


Figure 1: Bryce Carmichael providing a virtual presentation to municipal representatives of Jefferson County.



Welcome Legislators Phil Reed and Bobby Cantwell

Figure 2: Lauren Schifferle providing a virtual presentation to municipal representatives of Jefferson County.

Appendix C: Description of REDI Projects by County

Table B- 1: Niagara County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Newfane	Olcott Harbor	Installation of an offshore breakwater, Modifications to eastern and western containment walls	Shore Stabilization	$15,707,000
Newfane	Olcott Beach Berm	A man-made berm system	Shore Stabilization	$1,814,000
Youngstown	Village of Youngstown Waterfront	Installing shoreline stabilization measures, installation of new floating dock structures	Shore Stabilization	$2,103,000
Lewiston	Lewiston Landing	Construction of a new landing/pathway with railings, Replacing existing docks with floating structures	Shore Stabilization	$1,214,688
Wilson	Village of Wilson WWTP	Riprap in front of the WWTP electrical box, decommission the WWTP, Installing a pump station	Wastewater	$4,461,000
Wilson	Townline Pier	Additional riprap, raising the height of the pier	Shore Stabilization	$1,587,000
Wilson	Sunset Island	Modification of the road, grading and resurfacing	Bridge and Road Repair	$3,362,000
Somerset	Town of Somerset Multiple Use Site	Shoreline stabilization, natural vegetative enhancements	Shore Stabilization	$1,334,000
Somerset	YMCA Camp Kenan	A vegetated embankment	Shore Stabilization	$87,000
Niagara County	Submerged Structures	Structures clearly marked by installing temporary warning buoys	Warning Buoys	$50,000
Niagara County	Docks and Boat Launches	Replacement of fixed elevation docks with floating docks and slips	Shore Stabilization	$125,000

Table B- 2: Monroe County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Hamlin	Hamlin Septic Systems	Installation of low pressure sewer system	Wastewater	$7,900,000
Hamlin	Wautoma Beach Rd	Construction of a 200 LF breakwater, raise the elevation of the beach property	Shore Stabilization	$488,000
Irondequoit	Irondequoit Bay Swing Bridge	raise the elevation of the swing bridge open pit	Bridge and Road Repair	$500,000
Irondequoit	Bay Village Pump Station	Construction of a new submersible WWPS	Wastewater	$1,208,000
Irondequoit	Bay Shore Blvd Sewer System	Installation of a low-pressure sewer and conveyance system	Wastewater	$1,874,000
Irondequoit	St. Paul Terminus	Modifications to existing shoreline stabilization measures to create a continuous barrier	Combination Storm and Waste Water	$1,770,000
Irondequoit	Irondequoit Bay State Marine Park	Raising the boat launch and installing new docks, shoreline stabilization from boat launch to parking lot	Shore Stabilization	$2,670,000
Irondequoit	Culver Rd Storm Sewers	Modifications to the existing storm drains, installation of check valves.	Stormwater	$500,000
Irondequoit	Fishing Access at St. Paul	Construction of new and modified concrete walls, removable stop logs placed for pedestrian access	Shore Stabilization	$326,000
Irondequoit	German Village WWPS	Replacement of pumps with a higher capacity system and flood proofing the entire pump station	Wastewater	$150,000
Irondequoit	Sea Breeze Pump Station	Replacement of pumps with a higher capacity system and floodproofing the entire pump station	Wastewater	$150,000
Rochester	Port of Rochester	shoreline stabilization, try to combat eroding shore along the Genesee river	Shore Stabilization	$2,225,000
Monroe County	Sandbar WWPS	resiliency of the pump station near Irondequoit bay	Elevated walls	$250,000
Monroe County	Public Regional Docks	Replacement of fixed elevation docks with floating docks, Shoreline stabilization, Relocation of fuel pumps	Shore Stabilization	$1,776,000
Greece	Lake Shore Dr Storm Sewer	Replacing the existing storm water system with larger diameter piping, larger catch basins,	Stormwater	$2,060,000
Greece	Old Edgemere Dr Sewers	Sealing of 49 sanitary manholes against groundwater and surface water infiltration.	Combination Storm and Waste Water	$2,927,000

Greece	Crescent Beach Rd Sewers	Control storm and sanitary sewer surcharge during high water periods	Combination Storm and Waste Water	$1,160,000
Greece	Island Cottage to Crescent Beach	Replacing storm sewer system and installing check valves, Construction of storm water pumping station	Stormwater and Shore Stabilization	$850,000
Greece	Edgemere Cranberry Pond	Installation of new storm sewers, shoreline stabilization to reduce water overflowing onto the road	Stormwater and Shore Stabilization	$150,000
Greece	Round Pond Edgemere Dr	Extending the existing berm along Round Pond and its outlet	Shore Stabilization	$143,000
Greece	Edgemere Dr Storm Sewer	Replacement of the existing storm sewers, installing additional drain inlets, Installation of pumps	Stormwater	$1,500,000
Greece	Braddock Rd Sewers	Upsizing storm sewer and 22 lateral services. Raising sanitary pump station to an appropriate elevation	Stormwater and Shore Stabilization	$250,000
Greece	Channel Park	Installation of shoreline stabilization measures along the south shore to protect the park and boat launch	Shore Stabilization	$1,929,000
Greece	Edgemere Dr Road Repair	Raising the elevation of approximately 2,000 LF of Edgemere Dr	Bridge and Road Repair	$650,000
Webster	Lake Rd Repair	Raising road by 1-2 ft to protect against flooding	Bridge and Road Repair	$1,500,000
Webster	Lake Rd Pump Station	Replacing the present wastewater pumping system with larger submersible pumps.	Wastewater	$501,000
Webster	Sandbar Park	Construction of a berm along the water’s edge. Install new piping system for removal of ponded water	Shore Stabilization	$748,000
Webster	West Webster Fire dock	Construction of a floating dock and launch facility	Shore Stabilization	$77,000
Penfield	Empire Blvd Pump Station	Construction of a concrete wall surrounding each pump station	Elevated walls	$125,000
Parma	Parma Storm Sewers	Installation of check valves on approximately 15 storm drains. Construction of sumps.	Stormwater	$400,000
Parma	Parma Septic Systems	Installation of a low-pressure sewer system	Wastewater	$5,860,000

Table B- 3: Wayne County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Huron	Cresent Beach	Installation of natural and nature-based shoreline stabilization	Shore Stabilization	$14,630,000
Wolcott	Blind Sodus Bay	Stabilization of bluff along Blind Sodus Bay Rd	Shore Stabilization	$12,170,000
Wolcott	Port Bay	nature based shoreline stabilization, repair public access roadway	Bridge and Road Repair	$3,340,000
Sodus Point	Wickham Blvd and Greig St	storm water to existing and proposed outlets , providing tide gates	Stormwater and Shore Stabilization	$7,400,000
Sodus Point	White Birch Campground	Installing approximately 1,000 ft of shoreline stabilization	Shore Stabilization	$590,000
Sodus Point	Lakestones Dr	Repairing and improving existing shoreline stabilization	Shore Stabilization	$342,000
Sodus Point	Sodus Point Beach	Establishing a protective nature based dune system	Shore Stabilization	$490,000
Ontario	Ontario Main Wastewater Station	Constructing flood protection measures around the pump station	Elevated Walls	$400,000
Ontario	Ontario Dr	Installing shoreline stabilization along severely eroded portions	Shore Stabilization	$1,860,000
Williamson	Williamson Water Intake	Construction of an elevated wall around the raw water wet well	Elevated Walls	$260,000

Table B- 4: Orleans County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Kendall	Kendall Wastewater	Disconnecting 125 homes from the septic systems and connecting them to a wastewater system	Wastewater	$9,053,000
Kendall	Public Town Rd	Replacing end of culverts with box design systems at four locations, upgrade stabilization measures	Culvert Building	$1,500,000
Kendall	Thompson Dr	Installing natural or nature-based shoreline protection	Shoreline Stabilization	$131,000
Kendall	Route 237	Construction of a berm to further stabilize the shoreline and protect the area from future flooding	Shoreline Stabilization	$40,000
Carlton	Lakeshore Rd	Protecting the toe of the bluff with shoreline stabilization measures, Vegetation along the embankment	Shoreline Stabilization	$2,062,000
Carlton	Lakeside Park Rd East	Shoreline stabilizing the bluff with embankment vegetation, bluff will be graded back to a more stable slope	Shoreline Stabilization	$385,000

Carlton	Lakeside Park Rd West	Place protective materials along the shoreline, placement of riprap stone to protect the public water line	Shoreline Stabilization	$235,000
Yates	Yates Park and Expansion	Shoreline stabilization, new kayak launch and playground, 10 ft wide nature trail, upgraded parking lot area	Shoreline Stabilization	$2,531,000
Orleans County	Docks and Boat Launches	Replacement of fixed elevation docks with floating docks and slips, Modification and upgrades to boat launches	Shoreline Stabilization	$751,000

Table B- 5: Cayuga County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Fair Haven	Fair Haven Beach State Park	Demolishing the current parking lot, Raising a new parking lot with imported fill and re-paving	Bridge and Road repair	$1,200,000
Fair Haven	Phillips Park	Removal and reconstruction of boardwalk, Repairing and raising gabion wall	Shore Stabilization	$1,500,000
Fair Haven	West Barrier Bar Park	Milling and repaving of asphalt roadway, Regrading and refilling crushed stone parking lot	Bridge and Road repair	$600,000
Fair Haven	Standbrook Park	Removing and replacing the wooden dock with floating dock, Improving ADA access to the docks	Shore Stabilization	$250,000
Fair Haven	King St Boat Launch	Repairing the boat launch concrete ramp and retaining wall, modify adjacent properties to reduce further flooding	Shore Stabilization	$800,000
Fair Haven	Little Sodus Harbor	Extending the height of the existing shoreline stabilization, adding floating docks	Shore Stabilization	$250,000
Fair Haven	Lake St Pump House	Installing shoreline stabilization measures between two residential properties	Shore Stabilization	$250,000
Fair Haven	Nine Mile Creek Bike Path	Design of the 13 mile bike touring corridor with an emphasis on resiliency	Bike Path	$900,000
Sterling	West Bay Rd Storm Sewer	1.8 miles of stormwater collection system, Bioretention basins to infiltrate, store, and filter rainwater	Stormwater	$2,700,000
Sterling	Ontario Shores Dr	Moving, raising, and paving 0.6 miles of dirt road	Bridge and Road repair	$1,500,000
Sterling	Schoolcraft Water Tower	Installing of a water storage tank on Schoolcraft Rd, Extending water service to more lake parcels	Drinking water	$438,000

Sterling	Sterling Nature Center	Restoring the abandoned section of McIntyre Rd, Designing and constructing green infrastructure	Bridge and Road repair	$1,600,000

Table B- 6: Oswego County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Oswego	Port Authority East Operating Dock	Installing a shoreline stabilization to break the high water wave action	Shore Stabilization	$300,000
Oswego	Port Authority Ship Yard	Installing sheet pile in a new dock design for up to 25 boats	Shore Stabilization	$1,800,000
Oswego	Port Authority Lehigh Cement	Repairing a portion of dock by the Lehigh Cement facility	Shore Stabilization	$70,000
Oswego	Port Authority Marina	Installing additional floating dock kits, modification of dock electrical services	Shore Stabilization	$40,000
Oswego	Port Authority West Pier	Repairing shoreline stabilization measures on the west side	Shore Stabilization	$100,000
Oswego	Wrights Landing Marina	Raising the elevation of marina structures, Bioretention basins to infiltrate, store, and filter rainwater	Shore Stabilization	$6,100,000
Oswego	International Pier	Installing new water, sanitary sewer, stormwater collection, and electrical services, Improving the landscape	Combination Storm and Waste Water	$6,500,000
Oswego	Route 104	Extending existing sanitary sewer network	Wastewater	$4,800,000
Oswego	West Lake Rd	Replacing a 40-inch corrugated metal pipe (CMP) in order for stormwater to effectively discharge	Stormwater	$400,000
Oswego	Camp Hollis	Re-grading the shoreline bank, Installing stabilization measures	Shore Stabilization	$500,000
Oswego	Snake Swamp	Elevating existing road surface for approximately 1/2 mile	Bridge and Road Repair	$200,000
Oswego	County Route 89	Elevating and repairing portions of County Route 89	Bridge and Road Repair	$430,000
Sandy Creek	Sandy Pond Resiliency Project	Replacing sand along the shoreline	Shore Stabilization	$600,000
Sandy Creek	Sandy Creek Sewer District	Installing a sanitary sewer system and the construction of a WWTP	Wastewater	$200,000
Sandy Creek	YMCA Bridge	Replacing the bridge leading to the State Park at Sandy Island Beach	Bridge and Road Repair	$4,000,000

Mexico	Mexico Point Park	Nature-based shoreline stabilization, Natural and nature-based features will be considered	Shore Stabilization	$480,000
Scriba	Sithe Trail	Shoreline stabilization measures and erosion prevention, Installing a timber boardwalk	Shore Stabilization	$400,000
Scriba	Joe Fultz Blvd	NYDEC ecological assessment study, dredging, improving road culverts	Assessment study and implementation	$480,000
Richland	County Route 5	Replacing the eroded portion of the riprap, Reinforcing the existing concrete wall	Shore Stabilization	$500,000

Table B- 7: Jefferson County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Clayton	The Riverwalk	Raising the height of the Riverwalk, Installing shoreline stabilization	Shore Stabilization	$3,750,000
Clayton	Wastewater Collection and Treatment Plant	Chlorine contact tank upgrades, filter building and electrical and mechanical improvements, Wet-weather force mains	Wastewater	$2,370,000
Clayton	Crib Dock at Mary St Boat Launch	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$938,000
Clayton	Village Docks by Veteran's Monument	Installation of stabilization measures at waters edge, Floating docks	Regional Docks and Boat Launches	$183,000
Clayton	Frink Park Regional Dock	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$1,397,000
Clayton	Upper Landing on Grindstone Island Boat Launch	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$600,000
Clayton	Shoreline near Hotel and Riverwalk	Installation of stabilization measures at waters edge, Floating docks	Regional Docks and Boat Launches	$3,000,000

Clayton	Clayton Harbor Municipal Marina	Installation of stabilization measures at waters edge, Floating docks	Regional Docks and Boat Launches	$1,257,000
Alexandria Bay	Foundations at Water Treatment Facilities	Remediating the foundation walls, Installing shoreline stabilization	Shore Stabilization	$260,000
Alexandria Bay	Upper and Lower James dock	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$2,000,000
Alexandria Bay	Scenic View Park Pier	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$1,100,000
Cape Vincent	Market Street Sewer	Replacing the sewage collection mains and manholes on the affected streets, Replacing asbestos cement	Wastewater	$705,000
Cape Vincent	Point St	Reconstructing affected portions of the street, Replacing damaged sidewalks, Filling in exposed voids behind seawall	Bridge and Road Repair	$65,000
Cape Vincent	Real St	Resetting the top few tiers of the limestone portion of the seawall, filling in voids	Shore Stabilization	$103,000
Cape Vincent	East End Park	Resetting limestone portion of the seawall, raising the wall system, Constructing a quarry stone apron	Shore Stabilization	$1,000,000
Cape Vincent	Village-Owned Boat Ramp	Installation of stabilization measures at waters edge, Floating docks	Regional Docks and Boat Launches	$50,000
Cape Vincent	Village-Owned Dock	Installation of stabilization measures at waters edge, Floating docks	Regional Docks and Boat Launches	$50,000
Cape Vincent	Esseltyne Public Dock	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$3,106,000
Cape Vincent	Tibbets Point	Protecting the roadway by installing shoreline stabilization, Improving culvert infrastructure	Shore Stabilization	$1,145,000
Sackets Harbor	Seawall near WTP	Shoreline protection, Protect the water intake facility	Shore Stabilization	$160,000
Sackets Harbor	Brown Shore Rd	Raising the road 24 inches at a length of approximately 1,575 LF	Bridge and Road Repair	$2,500,000

Sackets Harbor	Market Square, including Boat launch on West Main St.	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$1,500,000
Lyme	County Rd 57	Raising roadway to avoid potential flooding, Installing shoreline protection	Bridge and Road Repair	$5,450,000
Lyme	New Access to Village, Docks, Infrastructure	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$1,182,000
Lyme	Point Salubrious	Restoration and repair impacted roadway addressing issues such as roadway erosion and shoulder undermining	Bridge and Road Repair	$1,500,000
Alexandria	Goose Bay Boat Launch	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$455,000
Orleans	Fishers Landing Boat Launch	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$400,000
Dexter	Boat Launch/Fishing Area	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$59,000

Table B- 8: St. Lawrence County REDI Projects

Municipality	*Project*	*Description*	*Type of Project*	*Cost of Project*
Ogdensburg	Maple City Trail	Increasing shoreline stabilization, erosion mitigation and flood resiliency	Shore Stabilization	$2,000,000
Ogdensburg	Fort de La Presentation’s Interpretive Trail	Shoreline stabilization and potentially raising the trails	Shore Stabilization	$1,295,000
Ogdensburg	Municipal Marina and City Docks close to Dobisky Center	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$911,973
Ogdensburg	Morissette Park and City Dock	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$4,875,000

Ogdensburg	Greenbelt Park	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$530,000
Morristown	Northumberland St	Removing the bridge which will open the channel within Morristown Bay	Bridge and Road Repair	$2,100,000
Waddington	Waddington Storm and Wastewater	Replacing and relining existing clay tile sewer mains, Constructing new stormwater mains, Constructing individual stormwater laterals	Combination Storm and Waste Water	$11,000,000
Waddington	Public Dockage	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$750,000
Hammond	Chippewa Bay Boat Launch	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$430,000
Hammond	Oak Point Boat Launch	Floating docks and slips, Relocate fuel pumps, Raising elevation of permanent structures	Regional Docks and Boat Launches	$140,000